SAIA®DDC-PLUS system solutions for building automation

Hardware and software
Saia-Burgess Controls offers a complete and practice-oriented product range for building automation. The aim of the catalogue is to show the builders, the planners, the system integrators and other DDC-PLUS-users the possibilities of application concerning building automation and make product selection easier.

The product range SAIA®DDC-PLUS, besides the standard HeaVAC functions, covers the following sectors:

- Lighting control
- Individual room control
- Energy management
- Alarming
- Time management
- Operator guide
- Interfaces and gateways
- Combined heating and power plants

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A most important impetus for technical progress was and is the human desire to get comfort and safety. That is the fact we drive our activity from.

Who we are
Saia-Burgess is an internationally successful group of enterprises concentrating our activity on strongly growing segments of the sectors automobile and industry as well as in building automation. Their core-competence is the development of innovative solutions from the connection between electronics and electro-mechanical sector.

Saia-Burgess is an enterprise with an export turnover of more than 320 Mio €, about 5000 staff members working worldwide.

What we want
Saia-Burgess wants to create sustainable added value for all buyer-groups – staff members, customers, shareholders. For this purpose they want to achieve an annual turnover-growth of more than 10 percent and an EBIT-margin of at least 10 percent. In the most important market segments covered by Saia-Burgess this enterprise is a leading supplier.

What we do
- Saia-Burgess, in cooperation with their customers, develop solutions contributing to the increase of comfort, safety and efficiency.
- Saia-Burgess produce switches, actuators (motors, activating magnets), sensors, electronic control devices and subsystems in Europe, America and Asia.
- Saia-Burgess sells their products by their worldwide sales and Tech-Centre-Organisation.
Saia-Burgess Controls – the 100% subsidiary ... for unique controls solutions

Saia-Burgess Controls in the European region constitutes a medium-sized enterprise dealing with control technology based on the values, standards and culture of the DDC-/PLC-technology. The international circle of customers consists primarily of enterprises who, as far as the application of these systems is concerned, possess a solution competence of their own or give a special identity of their own to their products using this technology.

The most important application sectors according to turnover on the one hand are in the classical production- and process-control and on the other hand in the building automation. The sector with the biggest growth rates is the automation and equipment of the infrastructure of daily life: airports, roads and highways, hospitals, swimming pools, shopping centres, cinemas etc.

Saia-Burgess Controls makes up for the difference in size compared to the regional market-dominating automation giants by technical specialisation, bigger flexibility and speed. In comparison to these large enterprises Saia-Burgess Controls is tangible and can be influenced. On the basis of DDC-/PLC-technology the firm is one of the best as far as elasticity, innovation and openness are concerned.

Within the Saia-Burgess Group the sector „Controls“ contributes to the economic group success. New market chances within the sector „Comfort and Safety“ are taken advantage of according to the orientation of the whole group.

The annually core-data of Saia-Burgess Controls:
– more than 25000 sold CPUs
– more than 120000 digital input/output modules
– more than 50000 analogue input/output modules
– this corresponds to a consolidated turnover of about 32 Mio €.

The technical profile of Saia-Burgess Controls as well as the technical profile of the customers and the broad application spectrum create many interesting niches on the vast market of the control-technology. Niches with sufficient potential which are consequently followed up and dealt with. For example Saia-Burgess Controls works in the sector Distributed Power Controls. Water turbines or heating power plants are working with automation systems from Saia Burgess Controls.
Saia-Burgess Controls in the Internet

Homepage: www.saia-burgess.com

Support: www.sbc-support.ch

VISI-PLUS: www.mst.ch/visiplus/visiplus.htm
The use of an intelligent system for the building automation is recommended especially in those sectors in which with the highest amount of flexibility and comfort a minimum of effort practically all the demands to an optimised installation must be fulfilled.

Heating and air conditioning, supervision and information installations, controls for lighting and sun blinds as well as charge management can be summarized and integrated into a total system with the building automation technology DDC-PLUS.

- Banks and savings-banks
- Office and administration buildings
- Hospitals and homes
- Department stores
- Industrial firms
- Warehouses
- Schools
- Dwelling-houses etc.
SAIA®DDC-PLUS
the universal automation system
that knows no facility limits
SAIA®DDC-PLUS is an automation system for the A to Z of building automation facilities. It is distinguished by its full modularity, varied communications and network possibilities, and consistent software compatibility within the overall system. It therefore meets the requirement for transparent structures with clear interfaces.

High quality hardware guarantees installations with a long lifetime. Changes of use, enlargement, reconditioning or adding to the scope of functions can be undertaken at any time, thanks to the open structure.
DDC-COMPACT – much functionality on minimum space

The compact controller with modular efficiency

The DDC-COMPACT in its basic features can be composed by the user in a most simple way: whether with or without manual/emergency control platform, whether with internal or external operator terminal. The optional terminal cover serves as a protection with field installations – the extension of the communication interfaces is made by additional modules that can be plugged in. You will find details on the drawing below.

The characteristic features

- Up to 20 digital inputs 24 VDC and up to 4 digital outputs 24 VDC
- 8 relay-outputs up to 4 A/250 VAC
  (4 make contact/4 changeover, max. continuous charge per device 24 A)
- Up to 16 analogue inputs (4 × 0…10 V plus 12 × Pt/Ni 1000)
- Generous user memory of 568 KBytes (128 KBytes as RAM and 240 KBytes as Flash-EPROM) for programs, data, texts
- Compact dimensions of 185 × 150 × 50 mm
- Connection by spring force terminals that can be plugged in for wires up to 1.5 mm²
- The DDC-COMPACT is best suited for application in ventilation and heating installations, compact air handling units, district heating delivery stations etc. by its clear data point structure

The communication features

- Up to 4 serial data interfaces as RS 485 (direct coupled or separated), RS 232 or RS 422
- SAIA®S-Bus as master or slave for connecting further SAIA® systems, room controllers or remote data points
- Connection to the LonWorks® network
- MP-Bus for MFT-drives from BELIMO®, installation bus EIB, M-Bus for the connection of e.g. counting devices for energy, Modbus (RTU and ASCII) for air handling units
- Telecommunication via modem (analogue, ISDN or GSM) with the functions distant diagnosis or distant maintenance or trouble-indication via SMS as well as distant programming
- Integrated web-server for easy operator leading via standard browser (to be delivered as from 10/2002).

Further information are to be found in Technical Information 26/345.
Technical data and ordering information

**Technical data**

**Digital inputs/outputs**
- 3 digital inputs, 24 VDC, input delay typically 0.2 ms
- 9 digital inputs, 24 VDC, input delay typically typ. 8 ms
- 4 digital inputs/outputs, 24 VDC, input delay typically 8 ms, outputs 0.5 A in range 0...32 V
- 4 relay outputs as 'make' contact, 2 x 2 A/2 x 4 A/250 VA, with manual/emergency control as option
- 4 relay outputs as changeover switch, 2 x 2 A/2 x 4 A/250 VA, with manual/emergency control as option

**Analogue inputs/outputs**
- 4 analogue inputs 0...10 V, resolution 10 bits, alternative use as digital inputs possible
- 4 analogue inputs Pt/Ni 1000, 2-wire, resolution 12 bits (= approx. 0.6 °C)
- 8 analogue inputs Pt/Ni 1000, 2-wire, resolution 12 bits (= approx. 0.15 °C)
- 4 analogue outputs 0...10 V, resolution 10 bits, with manual/emergency control and potentiometer as option

**User memory for programs, text and data blocks**
- 240 KBytes as flash EPROM and 128 KBytes as RAM

**Serial data interfaces (space A)**
<table>
<thead>
<tr>
<th>RS 232</th>
<th>RS 485</th>
<th>RS 485 galv.</th>
<th>RS 422</th>
<th>MP-Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td>GND</td>
<td>-</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>TXD</td>
<td>RX - TX</td>
<td>RX - TX</td>
<td>TX</td>
<td>A-COM</td>
</tr>
<tr>
<td>RXD</td>
<td>/RX - TX</td>
<td>/RX - TX</td>
<td>/TX</td>
<td>MST</td>
</tr>
<tr>
<td>RTS</td>
<td>-</td>
<td>-</td>
<td>RX</td>
<td>IN</td>
</tr>
<tr>
<td>CTS</td>
<td>-</td>
<td>-</td>
<td>/RX</td>
<td>GND</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>S-GND</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Field bus connections via hardware**
- SAIA®S-Bus as master or slave (RS 485), LONWORKS® and MP-Bus from BELIMO® as option

**Supply voltage**: 24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified

**Power consumption**: max. 10 W

**Processor**: CPU with 32 bit µC 68340 (16 MHz)

**Processing time**: bit command 5 µs, word command 20 µs

**RAM data protection** (user memory, real-time clock): 5...15 days with super-capacitor

**Noise emission**: CE mark according to EN 50081-1

**Noise immunity**: CE mark according to EN 50082-2

**Ambient temperature**: operation 0...+55 °C or 0...+40 °C (depending on mounting position), storage –20...+85 °C

**Atmospheric humidity**: 95 % relative humidity without condensation (DIN 40040, class F)

**Mechanical strength**: according to EN/IEC 61 151-2

**Standards and approvals**: EN/IEC 61 151-2, Germanischer Lloyd, Lloyd’s Register of Shipping, Det Norske Veritas, Polish Rejestr Statków, UL-USA, American Bureau of Shipping, UL-CDN

**Ordering information**

Devices are supplied ready-fabricated according to the following order code key:

<table>
<thead>
<tr>
<th>Base unit</th>
<th>PCD7.F..</th>
<th>Modem</th>
<th>Software</th>
<th>Terminal cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS1.C8..</td>
<td>0 = without</td>
<td>0 = without</td>
<td>0 = PG5</td>
<td>0 = without</td>
</tr>
<tr>
<td>A = ..F110</td>
<td>1 = analogue</td>
<td>A = macro</td>
<td>1 = with</td>
<td></td>
</tr>
<tr>
<td>B = ..F120</td>
<td>2 = ISDN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D = ..F150</td>
<td>3 = GSM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E = ..F180</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example: PCS1.C820 A200
- Base unit with graphics display and manual/emergency control, additional RS 422/RS 485 interface, ISDN modem, user programmable with PG5, without terminal cover

Orders placed must specify the complete code.

**Base units**
- PCS1.C820 with graphics display and manual/emergency control
- PCS1.C821 with graphics display
- PCS1.C822 with manual/emergency control
- PCS1.C823 without display and manual/emergency control

**Base units with LONWORKS® connection**
- PCS1.C880 with graphics display and manual/emergency control
- PCS1.C881 with graphics display
- PCS1.C882 with manual/emergency control
- PCS1.C883 without display and manual/emergency control

**Accessories**
- 4'111'4927'0 Terminal cover
- 4'109'4849'0 Set for wall-mounting

**Communications modules**
- PCD7.F110 interface RS 422/RS 485, electrically connected
- PCD7.F120 interface RS 232 (RTS/CTS only supported)
- PCD7.F150 interface RS 485, electrically isolated
- PCD7.F180 MP-Bus connection module for BELIMO® MFT drives

**Modem modules**
- 4'636'6683'0 analogue
- 4'636'6684'0 ISDN-TA
- 4'636'6749'0 GSM (in preparation)
Overview of base unit features PCD1 and PCD2

<table>
<thead>
<tr>
<th>Differentiation of base units PCD1</th>
<th>PCD1.M110</th>
<th>PCD1.M120</th>
<th>PCD1.M130</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs/outputs or I/O module sockets</td>
<td>64¹</td>
<td>64¹</td>
<td>64¹</td>
</tr>
<tr>
<td>Processing time ²) bit command word command</td>
<td>5 µs</td>
<td>5 µs</td>
<td>5 µs</td>
</tr>
<tr>
<td>Serial data ports PGU, socket A</td>
<td>2 RS 232, RS 485 built-in</td>
<td>1–2 RS 232, RS 422, RS 485, TTY/current loop 20 mA</td>
<td>1–2 RS 232, RS 422, RS 485, TTY/current loop 20 mA</td>
</tr>
<tr>
<td>Network connections (further network connections see chapter 5 and 6)</td>
<td>SAIA®S-Bus (built-in)</td>
<td>SAIA®S-Bus PROFIBUS DP LonWorks®</td>
<td>SAIA®S-Bus PROFIBUS DP LonWorks® Ethernet-TCP/IP ³)</td>
</tr>
<tr>
<td>Socket B for network and/or small terminal</td>
<td>[no ⁴)</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>User memory RAM standard equipment Expansion with RAM, EPROM or Flash-EPROM</td>
<td>17 KBytes up to 140 KBytes</td>
<td>17 KBytes up to 140 KBytes</td>
<td>17 KBytes up to 140 KBytes</td>
</tr>
<tr>
<td>Date-time</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Data protection</td>
<td>30 days with super cap</td>
<td>7 days with super cap</td>
<td>1–3 years ⁵) with lithium battery</td>
</tr>
<tr>
<td>Interrupt inputs or fast counter inputs</td>
<td>no</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

¹) When using digital I/O modules PCD2.E16.. or ..A46.. with 16 I/Os each.
²) Processing time is dependent on the load placed on communications ports.
³) Ethernet-TCP/IP as configured system with type no. PCD1.M130F450.
⁴) Small terminal PCD7.D162 possible.
⁵) 2 kHz

2.1
### Differentiation of base units PCD2

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs/outputs or I/O module sockets</td>
<td>128¹</td>
<td>255¹ ² 16³</td>
<td>255¹ ² 16³</td>
<td>255¹ ² 16³</td>
</tr>
<tr>
<td>Connector for expansion housing</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Processing time ⁴</td>
<td>4 µs 20 µs</td>
<td>4 µs 20 µs</td>
<td>2 µs 10 µs</td>
<td>2 µs 10 µs</td>
</tr>
<tr>
<td>Serial data ports (further network connections see chapter 5 and 6)</td>
<td>SAIA®S-Bus</td>
<td>SAIA®S-Bus PROFIBUS FMS</td>
<td>SAIA®S-Bus PROFIBUS FMS</td>
<td>SAIA®S-Bus PROFIBUS FMS</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS DP</td>
<td>PROFIBUS DP</td>
<td>PROFIBUS DP</td>
<td>PROFIBUS DP</td>
</tr>
<tr>
<td></td>
<td>LONWORKS®</td>
<td>Ethernet-TCP/IP</td>
<td>LONWORKS®</td>
<td>Ethernet-TCP/IP</td>
</tr>
<tr>
<td>Socket B(1) for network and/or data ports, display, small terminal</td>
<td>no ¹</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Socket B2 for network and/or data ports</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>User memory</td>
<td>128 KBytes up to 640 KBytes</td>
<td>128 KBytes up to 640 KBytes</td>
<td>128 KBytes up to 640 KBytes</td>
<td>1024 KBytes up to 640 KBytes</td>
</tr>
<tr>
<td>Date-time</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Data protection</td>
<td>1–3 years ¹ with lithium battery</td>
<td>1–3 years ¹ with lithium battery</td>
<td>1–3 years ¹ with lithium battery</td>
<td>1–3 years ¹ with lithium battery</td>
</tr>
<tr>
<td>Interrupt inputs or fast counter inputs</td>
<td>no</td>
<td>2 1 kHz</td>
<td>2 1 kHz</td>
<td>2 1 kHz</td>
</tr>
</tbody>
</table>

¹) When using digital I/O modules PCD2.E16.. or ..A46.. with 16 I/Os each.
²) 255 addresses (0…254) are available for inputs/outputs. Address 255 is reserved for the watch-dog.
³) Together with the ..C100 expansion housing.
⁴) Processing time is dependent on the load placed on communications ports.
⁵) Small terminal PCD7.D162 possible.
⁶) Depends on ambient temperature.

### General technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>PCD1/PCD2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified</td>
</tr>
<tr>
<td>Power consumption</td>
<td>10 W for 32 I/Os, 15 W for 64 I/Os, 20 W for 128 I/Os</td>
</tr>
<tr>
<td>Load capacity 5 V bus</td>
<td>PCD1: max. 750 mA</td>
</tr>
<tr>
<td></td>
<td>PCD2: max. 1600 mA</td>
</tr>
<tr>
<td>Noise emission</td>
<td>CE mark according to EN 50081-1</td>
</tr>
<tr>
<td>Noise immunity</td>
<td>CE mark according to EN 5082-2</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>operation 0...+55°C or 0...+40°C (depending on mounting position) storage -20...+85°C</td>
</tr>
<tr>
<td>Atmospheric humidity</td>
<td>95 % r. H. without dew formation (DIN 40040, class F)</td>
</tr>
<tr>
<td>Mechanical strength</td>
<td>according to EN/IEC 61 151-2</td>
</tr>
<tr>
<td>Standards/approvals</td>
<td>EN/IEC 61 151-2, Germanischer Lloyd, Lloyd's Register of Shipping, Det Norske Veritas, Polski Rejestr Statków, UL-USA, American Bureau of Shipping, UL-CDN</td>
</tr>
</tbody>
</table>
Performance range of the System PCD1

For a small, compact process control device, the intelligence and adaptability of the PCD1 is unique due to its modular structure:

- The base unit includes **4 I/O module sockets** which can be equipped as desired with digital and analogue modules, or with counting, measuring and motion control modules.

- The base unit already provides a **user memory** of 17 KBytes in RAM for programs, texts and data blocks. This user memory can be expanded to 140 KBytes by the addition of another RAM, EPROM or Flash EPROM chip.

- Each base unit provides two **serial communications interfaces**.

- The network connection modules opens up the world of **standardised network communications** via PROFIBUS DP (as master or slave) or LonWorks®. Further bus connections as EIB, Modbus, M-Bus, MP-Bus (BELIMO), GENibus (Grundfos), etc. starting from page 4.1.

- **Telecommunication via modem**: Digital and analogue modem modules, combined with the appropriate modem software library, enable telecommunication with the PCD.

- **Ethernet-TCP/IP**: An intelligent co-processor module provides the PCD1.M130 with access to the Ethernet.

- **The small terminals PCD7.D16..** are mounted directly on the cover of controllers. This combination results in a compact controller with the capability for direct display and entry (details on page 7.11).

- **The real-time clock** in the ..M120/..M150 allows date or time-dependent control of any function and/or transmission of data and information on operating states.

- **The PCD1 has an integral watch-dog monitoring circuit** in the system program. When the watch-dog is activated, processing of the user program will be monitored periodically and a coldstart executed if an error is detected. If the required security measures are to be triggered via an electrically isolated relay contact, the external watch-dog relay should be used with a time domain of 0.05...1 s (order code: KOP128J7BA VPN00).

You will get further information about system PCD1 from the Technical Information 26/350.
Base units PCD1

**General technical data**

**Central inputs/outputs**
fit with any 4 I/O modules for up to 64 I/Os
(details about input/output modules starting from page 2.10, about modem modules on page 4.9)

**User memory for programs, texts and data blocks**
17 KBytes RAM in basic assembly, expandable up to 140 KBytes as RAM, 12 KBytes as RAM +128 KBytes as EEPROM or +112 KBytes as Flash-EPROM

**Processing time**
5 µs bit processing, 20 µs word processing

**Serial data port** (PGU connector)
1× RS 232 with RTS/CTS

**Field bus connection**
SAIA®S-Bus as master or slave (RS 485)

**Supply voltage**
24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified

**Power consumption**
10 W for 32 I/Os, 15 W for 64 I/Os

**Noise emission**
CE mark according to EN 50081-1

**Noise immunity**
CE mark according to EN 50082-2

**Ambient temperature**
Operation 0…+55 °C or 0…+40 °C (depending on mounting position), storage -20…+85 °C

**Atmospheric humidity**
95 % r. H. without dew formation (DIN 40040, class F)

**Mechanical strength**
according to EN/IEC 61 151-2

**Standards/approvals**
EN/IEC 61 151-2, Germanischer Lloyd, Lloyd’s Register of Shipping, Det Norske Veritas, Polski Rejestr Statków, UL-USA, American Bureau of Shipping, UL-CDN

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**Base unit PCD1.M110**

**RAM data protection** (user memory)
30 days with super capacitor

**Serial data port** (built-in)
1× RS 485, electrically connected, with line termination resistors capable of activation, suitable for SAIA®S-Bus

**Base unit PCD1.M120**

**RAM data protection** (user memory, date-time)
7 days with super capacitor

**Fast counters and interrupt inputs**
2, for interrupts or counting up to 1 kHz

**Real-time clock**
in basic assembly

**Serial data port** via socket A
1× RS 232 (PGU) and 1× RS 232 (suitable for modem connection), RS 422/RS 485 or TTY/current loop 20 mA (details about communications modules on page 4.8)

**Field bus connection** via socket B
PROFIBUS DP as master or slave, LonWorks® (details about connection modules on page 4.8)

**Base unit PCD1.M130**

**RAM data protection** (user memory, date-time)
1–5 years with Lithium battery (depends on ambient temperature)

**Ethernet-TCP/IP network connection** via socket B with connection module PCD7.F650 and special housing cover 4’104’7409’0, or as configured system with type no. PCD1.M150F650 (details on page 5.1)

**Others technical data as PCD1.M120**

**Extended memory components**

4’502’7013’0  RAM chip with 128 KBytes
4’502’7126’0  EPROM chip with 128 KBytes
4’502’7141’0  Flash-EPROM chip with 128 KBytes
Performance range of the System PCD1

The PCD2's modular structure on 5 levels makes it exceptionally adaptable for a compact process control device:

- The base unit includes **8 I/O module socket** which can be equipped as desired with digital and analogue modules, or with counting, measuring and motion control modules.
- The **expansion housings** offer space for an additional 4/8 I/O modules.
- The **coupling bus module** makes it possible to run not only the manual operation modules but also up to 8 I/O modules from the PCD4 system.
- For programs texts and data blocks **up to 1 MByte user memory** (PCD2.M170) can be used.
- **Up to 6 serial data ports** (PCD2.M170) satisfies a wide variety of communications applications.
- The network connection modules opens up the world of **standardised network communications** via PROFIBUS FMS, PROFIBUS DP (as master or slave) or LonWorks®. Further bus connections as EIB, Modbus, M-Bus, MP-Bus (BELIMO), GENIbus (Grundfos), etc. starting from page 4.1. On the two sockets B1 and B2 of the PCD2.M170 interface as well as network modules can be combined.
- **Telecommunication via modem**: Digital and analogue modem modules, combined with the appropriate modem software library, enable telecommunication with the PCD.
- **Ethernet-TCP/IP**: The intelligent co-processor module provides the PCD with access to the Ethernet.
- **The small terminals PCD7.D16..** are mounted directly on the cover of controllers. This combination results in a compact controller with the capability for direct display and entry (details on page 7.11).
- **The real-time clock**, which is present in every base unit, allows date or time-dependent control of any function and/or transmission of data and information on operating states.
- The **watch-dog monitoring circuit** checks the regular processing of the user program. An error opens a relay contact, whose potential-free contact (1.0 A, 48 VAC/VDC) can be used to trigger the necessary measures.

You will get further information about system PCD2 from the Technical Information 26/551.
**Base units PCD2**

### General technical data

- **RAM data protection** (user memory, date-time)
  1–3 years with Lithium battery (depends on ambient temperature)

- **Serial data port** (PGU connector)
  1x RS232 with RTS/CTS or RS485 electrically connected, with line termination resistors capable of activation, suitable for SAIA® S-Bus

- **Field bus connection**
  SAIA®S-Bus as master or slave (RS485)

- **Real-time clock**
  in basic assembly

- **Supply voltage**
  24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified

- **Power consumption**
  15 W for 64 I/Os, 20 W for 128 I/Os,

- **Noise emission**
  CE mark according to EN 50081-1

- **Noise immunity**
  CE mark according to EN 5082-2

- **Ambient temperature**
  Operation 0…+55 °C or 0…+40 °C (depending on mounting position), storage -20…+85 °C

- **Atmospheric humidity**
  95 % r. H. without dew formation (DIN 40040, class F)

- **Mechanical strength**
  according to EN/IEC 61 151-2

- **Standards/approvals**
  EN/IEC 61 151-2, Germanischer Lloyd, Lloyd’s Register of Shipping, Det Norske Veritas, Polski Rejestr Statków, UL-USA, American Bureau of Shipping, UL-CDN

### Base unit PCD2.M110

- **Central inputs/outputs**
  fit with any 8 I/O modules for up to 128 I/Os (details about input/output modules starting from page 2.10, about modem modules on page 4.9)

- **User memory for programs, texts and data blocks**
  128 KBytes RAM in basic assembly, expandable up to 640 KBytes as RAM or 128 KBytes RAM +512 KBytes EPROM or +448 KBytes Flash-EPROM (details about extended memory components on page 2.7)

- **Processing time**
  4µs bit processing, 20µs word processing

- **Serial data port** via socket A
  1x RS232 (suitable for modem connection), RS422/RS485 or TTY/current loop 20mA (details about communications modules on page 4.8)

### Base unit PCD2.M120

- **Central inputs/outputs**
  fit with any 8 I/O modules for up to 128 I/Os, additional 4/8 I/O module socket via expansion housing for up to 255 I/Os (details about input/output modules starting from page 2.10, about modem modules on page 4.9, about expansion of I/O capacity via expansion housing or coupling bus module on page 2.9)

- **Fast counters and interrupt inputs**
  2, for interrupts or counting up to 1 kHz

- **Serial data ports** via socket B
  1x RS232 (suitable for modem connection), RS422/RS485, TTY/current loop 20mA or 2x RS232 (details about communications modules on page 4.8)

- **Field bus connection** via socket B
  PROFIBUS FMS, PROFIBUS DP as master or slave, LonWorks® (details about connection modules on page 4.8)

- **User memory, processing time and serial data port** as PCD1.M110

### Base unit PCD2.M150

- **Processing time**
  2µs bit processing, 10µs word processing

- **Ethernet-TCP/IP network connection** via socket B
  with connection module PCD7.F650 and special housing cover 4’104’7410’0, or as configured system with type no. PCD2.M150/F650 (details on page 5.1)

### Others technical data as PCD2.M120 or ..M110

### Base unit PCD2.M170

see next page
PCD2.M170 – The top model of the PCD2 system

**Base unit PCD2.M170**

Central inputs/outputs
fit with any 8 I/O modules for up to 128 I/Os, additional 4/8 I/O module socket via expansion housing for up to 255 I/Os (details about input/output modules starting from page 2.10, about modem modules on page 4.9, about expansion of I/O capacity via expansion housing or coupling bus module on page 2.9)

User memory for programs, texts and data blocks
1 MByte RAM in basic assembly

Flash-card PCD7.R400 (as option)
1 MByte for backup the user program

Processing time
2 µs bit processing, 10 µs word processing

Fast counters and interrupt inputs
2, for interrupts or counting up to 1 kHz

Serial data port (PGU connector)
1× RS 232 with RTS/CTS or RS 485 electrically connected, with line termination resistors capable of activation, suitable for SAIA® S-Bus

Serial data port via socket A
1× RS 232 (suitable for modem connection), RS 422/RS 485 or TTY/current loop 20 mA (details about communications modules on page 4.8)

Serial data ports via socket B1 or B2
1× RS 232 (suitable for modem connection)/RS 422/RS 485 or 2× RS 232 (details about communications modules on page 4.8)

Field bus connection via socket B1 or B2¹)
PROFIBUS FMS, PROFIBUS DP as master or slave, LonWorks® (details about connection modules on page 4.8)

Ethernet-TCP/IP network connection via socket B2
with connection module PCD7.F650 (details on page 5.1)

¹) The following combinations are not possible:
2× PROFIBUS DP as slave or 2× LonWorks®

**Extended memory components**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'502'7013'0</td>
<td>RAM chip with 128 KBytes</td>
</tr>
<tr>
<td>4'502'7155'0</td>
<td>RAM chip with 512 KBytes</td>
</tr>
<tr>
<td>4'502'7126'0</td>
<td>EEPROM chip with 128 KBytes</td>
</tr>
<tr>
<td>4'502'7223'0</td>
<td>EEPROM chip with 512 KBytes</td>
</tr>
<tr>
<td>4'502'7141'0</td>
<td>Flash-EPROM chip with 128 KBytes</td>
</tr>
<tr>
<td>4'502'7224'0</td>
<td>Flash-EPROM chip with 512 KBytes</td>
</tr>
<tr>
<td>PCD7.R400</td>
<td>Flash-card with 1 MByte for PCD2.M170 as backup</td>
</tr>
</tbody>
</table>
PCD2.M250 – the modular automation system with integrated and modular industrial PC

This communications prodigy conceals not only a DDC substation, type PCD2.M150, with its versatile communications capabilities, but also an industrial grade PC with a modular architecture based on standard PC/104 boards.

Communication between the ..M150 and the PC/104 is via a powerful, dual-port RAM, so that the PC has very fast access to all the ..M150’s media. As the adjacent illustration shows, the PCD2.M250 has on the PC side a whole number of communications channels that are important for building automation. Particular emphasis is placed on the direct internet connection with all its possibilities and the ethernet communications board for connection to the local intranet.

Unique benefits for the user

■ Just one compact unit for process and PC functions.
■ Same scope of function as for the standard ..M150 DDC substation. The master control unit is also absolutely identical with regard to hardware.
■ Possibility of modular expansion to the PC section with standard PC/104 modules.
■ Both control halves are, however, completely independent of each other, with both sides having an autonomous supply and their own processors.
■ Use of the operating system of your choice (e.g. Windows 95, 98 or NT, or ...).
■ Programming in any high-level language or use of software libraries available worldwide.
■ Installation of required building or facility management software in the same device.
■ Additional communications via ethernet (TCP/IP) or the worldwide internet.
■ Use as BACnet server, details on page 4.11.

Base unit PCD2.M250

Central inputs/outputs
fit with any 8 I/O modules for up to 128 I/Os, additional 4/8 I/O module socket via expansion housing for up to 255 I/Os (details about input/output modules starting from page 2.10, about modem modules on page 4.9, about expansion of I/O capacity via expansion housing or coupling bus module on page 2.9)

User memory for programs, texts and data blocks
128 KBytes RAM in basic assembly, expandable up to 640 KBytes as RAM or 128 KBytes RAM + 512 KBytes EPROM or + 448 KBytes Flash-EPROM (details about extended memory components on page 2.7)

Processing time
2 µs bit processing, 10 µs word processing

Fast counters and interrupt inputs
2, for interrupts or counting up to 1 kHz

Serial data port (PGU connector)
1x RS232 with RTS/CTS or RS485 electrically connected, with line termination resistors capable of activation, suitable for SAIA® S-Bus

Serial data port via socket A
1x RS232 (suitable for modem connection), RS422/RS485 or TTY/current loop 20 mA (details about communication modules on page 4.8)

Serial data ports via socket B
1x RS232 (suitable for modem connection), RS422/RS485, TTY/current loop 20 mA or 2x RS232 (details about communication modules on page 4.8)

Field bus connection via socket B
PROFIBUS FMS, PROFIBUS DP as master or slave, LonWorks® (details about connection modules on page 4.8)

Integrated industrial PC
5 slots for PC/104 boards, communications PLC<=>PC via dual-port RAM

PC/104 boards from SAIA
On PCD2.M250 controllers, any off-the-shelf PC/104 boards can be used. However, the advantages of using original SAIA components should not be underestimated: CPUs from SAIA are plugged directly onto the PC platform, which means that all the connecting cables to external connections (KB, VGA, FD, LPT1 and COM1/2) are no longer needed. The hard disk fits onto the housing with an angle bracket and is connected directly to the CPU by a short length of ribbon cable. Cutouts in the housing exactly fit the PC CARD board and the BNC connection to the Ethernet controller.

Further information on items currently offered can be obtained from your local agent.
Expansion of I/O capacity

PCD2.C100 and .C150 expansion housings

The expansion housings offer space for an additional 4/8 I/O modules. Connection to the base unit is via a 26-core expansion cable.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.C100</td>
<td>Expansion housing for 8 additional I/O modules</td>
</tr>
<tr>
<td>PCD2.C150</td>
<td>Expansion housing for 4 additional I/O modules</td>
</tr>
<tr>
<td>PCD2.K100</td>
<td>Expansion cable, length 0.5 m</td>
</tr>
<tr>
<td></td>
<td>(for mounting beneath each other, max. gap 150 mm)</td>
</tr>
<tr>
<td>PCD2.K110</td>
<td>Expansion cable, length 0.7 m</td>
</tr>
<tr>
<td></td>
<td>(for mounting side-by-side)</td>
</tr>
</tbody>
</table>

PCD4.C225 coupling bus module for PCD4 modules

Starting from a PCD2.M120/.M150/.M170, this coupling bus module makes it possible to run not only the manual operation modules but also I/O modules from the PCD4 series.

<table>
<thead>
<tr>
<th>Digital input/output modules</th>
<th>Manual operation modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.E11..</td>
<td>PCD4.A810</td>
</tr>
<tr>
<td>PCD4.E60..</td>
<td>PCD4.A820</td>
</tr>
<tr>
<td>PCD4.A200</td>
<td>PCD4.W800</td>
</tr>
<tr>
<td>PCD4.A250</td>
<td></td>
</tr>
<tr>
<td>PCD4.A350</td>
<td></td>
</tr>
<tr>
<td>PCD4.A400</td>
<td></td>
</tr>
<tr>
<td>PCD4.A410</td>
<td></td>
</tr>
<tr>
<td>PCD4.B90..</td>
<td></td>
</tr>
</tbody>
</table>

Digital input/output modules

Manual operation modules

Analogue input/output modules

As shown in the illustration below, the .C225 is connected to the PCD2 via a PCD2.K11 expansion cable. A choice of 5 lengths is available. Using standard PCD4.C220 or .C260 I/O bus modules, up to 6 additional module sockets can be attached to the right-hand side of the .C225 coupling bus module, making a total of 8.


PCD4.C225 Coupling bus module with 2 module sockets for PCD4 series I/O modules (details for PCD4 I/O modules starting from page 3.7)

PCD4.C220 I/O bus module with 2 additional module sockets

PCD4.C260 I/O bus module with 6 additional module sockets

PCD2.K100 Expansion cable, length 0.5 m

PCD2.K110 Expansion cable, length 0.7 m

PCD2.K120 Expansion cable, length 2 m
Overview of digital and analogue input/output modules

### Digital input/output modules

<table>
<thead>
<tr>
<th>Type</th>
<th>Total I/Os</th>
<th>Input voltage</th>
<th>Breaking capacity</th>
<th>Input filter</th>
<th>Electrical isolation</th>
<th>Current draw <strong>1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.E110</td>
<td>8 I</td>
<td>15…30 VDC</td>
<td>8 ms</td>
<td>no</td>
<td>typ. 12 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.E111</td>
<td>8 I</td>
<td>15…30 VDC</td>
<td>0.2 ms</td>
<td>no</td>
<td>typ. 12 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.E160/5</td>
<td>16 I</td>
<td>15…30 VDC</td>
<td>8 ms</td>
<td>no</td>
<td>typ. 50 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.E161/.6</td>
<td>16 I</td>
<td>15…30 VDC</td>
<td>0.2 ms</td>
<td>no</td>
<td>typ. 50 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.E610</td>
<td>8 I</td>
<td>15…30 VDC</td>
<td>10 ms</td>
<td>yes</td>
<td>typ. 12 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.E611</td>
<td>8 I</td>
<td>15…30 VDC</td>
<td>1 ms</td>
<td>yes</td>
<td>typ. 12 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.E500</td>
<td>6 I</td>
<td>115…230 VAC</td>
<td>20 ms</td>
<td>yes</td>
<td>typ. 1 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.B100</td>
<td>2 I + 2 O + 4 I/O</td>
<td>0.5 A/5…32 VDC</td>
<td></td>
<td>no</td>
<td>typ. 15 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A400</td>
<td>8 O, transistor</td>
<td>0.5 A/5…32 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 15 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A410</td>
<td>8 O, transistor</td>
<td>0.5 A/5…32 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 50 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A460/..5</td>
<td>16 O</td>
<td>2 A/10…32 VDC</td>
<td></td>
<td>no</td>
<td>typ. 12 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A300</td>
<td>6 O, transistor</td>
<td>2 A/10…32 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 15 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A200</td>
<td>6 O, relay (make)</td>
<td>2 A/50 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 10 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A210</td>
<td>6 O, relay (break)</td>
<td>2 A/50 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 10 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A220</td>
<td>6 O, relay (make)</td>
<td>2 A/50 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 12 mA</td>
<td></td>
</tr>
<tr>
<td>PCD2.A250</td>
<td>8 O, relay (make)</td>
<td>2 A/50 VDC</td>
<td></td>
<td>yes</td>
<td>typ. 15 mA</td>
<td></td>
</tr>
</tbody>
</table>

**1** Current draw from internal 5 V bus (depending on number of active input or output channels), loading capacity max. 750 mA for PCD1 and max. 1600 mA for PCD2

### Analogue input/output modules

<table>
<thead>
<tr>
<th>Type</th>
<th>Total channels</th>
<th>Signal ranges</th>
<th>Resolution</th>
<th>Current draw <strong>5 V bus</strong></th>
<th>Current draw <strong>24 V bus</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.W100</td>
<td>4 I</td>
<td>0 V…+10 V / –10 V…0 V / –10 V…+10 V</td>
<td>12 bit</td>
<td>45 mA</td>
<td>15 mA</td>
</tr>
<tr>
<td>PCD2.W105</td>
<td>4 I</td>
<td>0 mA…+20 mA / –20 mA…0 mA / –20 mA…+20 mA</td>
<td>12 bit</td>
<td>45 mA</td>
<td>15 mA</td>
</tr>
<tr>
<td>PCD2.W110</td>
<td>4 I</td>
<td>Pt 100: –50 °C…+150 °C</td>
<td>12 bit</td>
<td>45 mA</td>
<td>30 mA</td>
</tr>
<tr>
<td>PCD2.W111</td>
<td>4 I</td>
<td>Ni 100: –50 °C…+150 °C</td>
<td>12 bit</td>
<td>45 mA</td>
<td>30 mA</td>
</tr>
<tr>
<td>PCD2.W112</td>
<td>4 I</td>
<td>Pt 1000: –50 °C…+150 °C</td>
<td>12 bit</td>
<td>45 mA</td>
<td>20 mA</td>
</tr>
<tr>
<td>PCD2.W113</td>
<td>4 I</td>
<td>Ni 1000: –50 °C…+150 °C</td>
<td>12 bit</td>
<td>45 mA</td>
<td>20 mA</td>
</tr>
<tr>
<td>PCD2.W114</td>
<td>4 I</td>
<td>Pt 100: 0 °C…+350 °C</td>
<td>12 bit</td>
<td>45 mA</td>
<td>30 mA</td>
</tr>
<tr>
<td>PCD2.W200</td>
<td>8 I</td>
<td>0 V…+10 V</td>
<td>10 bit</td>
<td>8 mA</td>
<td>5 mA</td>
</tr>
<tr>
<td>PCD2.W210</td>
<td>8 I</td>
<td>0 mA…+20 mA / +20 mA</td>
<td>10 bit</td>
<td>8 mA</td>
<td>5 mA</td>
</tr>
<tr>
<td>PCD2.W220</td>
<td>8 I</td>
<td>Pt 1000: –50 °C…+400 °C / Ni 1000: –50 °C…+200 °C</td>
<td>12 bit</td>
<td>8 mA</td>
<td>16 mA</td>
</tr>
<tr>
<td>PCD2.W300</td>
<td>8 I</td>
<td>0 V…+10 V</td>
<td>12 bit</td>
<td>8 mA</td>
<td>5 mA</td>
</tr>
<tr>
<td>PCD2.W310</td>
<td>8 I</td>
<td>0 mA…+20 mA / +20 mA</td>
<td>12 bit</td>
<td>8 mA</td>
<td>5 mA</td>
</tr>
<tr>
<td>PCD2.W340</td>
<td>8 I</td>
<td>0 V…+10 V / 0 mA…+20 mA / Pt 1000: –50 °C…+400 °C / Ni 1000: –50 °C…+200 °C</td>
<td>12 bit</td>
<td>8 mA</td>
<td>20 mA</td>
</tr>
<tr>
<td>PCD2.W350</td>
<td>8 I</td>
<td>Pt 100: –50 °C…+600 °C / Ni 100: –50 °C…+250 °C</td>
<td>12 bit</td>
<td>8 mA</td>
<td>30 mA</td>
</tr>
<tr>
<td>PCD2.W360</td>
<td>8 I</td>
<td>Pt 1000: –50 °C…+150 °C</td>
<td>12 bit</td>
<td>8 mA</td>
<td>20 mA</td>
</tr>
<tr>
<td>PCD2.W500</td>
<td>2 I + 2 O + 4 I/O</td>
<td>0 V…+10 V / –10 V…+10 V</td>
<td>12 bit</td>
<td>200 mA</td>
<td>0 mA</td>
</tr>
<tr>
<td>PCD2.W510</td>
<td>2 I + 2 O + 4 I/O</td>
<td>0 mA…+20 mA / –20 mA…+20 mA</td>
<td>12 bit</td>
<td>200 mA</td>
<td>0 mA</td>
</tr>
</tbody>
</table>

**1** Current draw from internal 5 V bus, loading capacity max. 750 mA for PCD1 and max. 1600 mA for PCD2

**2** Current draw from internal 24 V bus, loading capacity max. 100 mA for PCD1 and max. 200 mA for PCD2

**3** +4…+20 mA via user program

**4** Special versions for example NTC sensors on page 2.12
## Digital input/output modules

### Digital input modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Inputs/Outputs</th>
<th>Voltage</th>
<th>Input Delay</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.E110</td>
<td>8</td>
<td>24 VDC</td>
<td>8 ms (pulsed)</td>
<td>possible</td>
</tr>
<tr>
<td>PCD2.E111</td>
<td>16</td>
<td>24 VDC</td>
<td>0.2 ms (smoothed)</td>
<td></td>
</tr>
<tr>
<td>PCD2.E160</td>
<td>16</td>
<td>24 VDC</td>
<td>8 ms (pulsed)</td>
<td>possible</td>
</tr>
<tr>
<td>PCD2.E161</td>
<td>16</td>
<td>24 VDC</td>
<td>0.2 ms (smoothed)</td>
<td></td>
</tr>
<tr>
<td>PCD2.E610</td>
<td>8</td>
<td>24 VDC</td>
<td>10 ms (pulsed)</td>
<td>possible</td>
</tr>
<tr>
<td>PCD2.E611</td>
<td>8</td>
<td>24 VDC</td>
<td>1 ms (smoothed)</td>
<td></td>
</tr>
</tbody>
</table>

### Transistor output modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Outputs</th>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.A400</td>
<td>8</td>
<td>24 VDC/0.5 A</td>
<td></td>
</tr>
<tr>
<td>PCD2.A410</td>
<td>16</td>
<td>0.5 A/24 VDC</td>
<td></td>
</tr>
</tbody>
</table>

### Relay output modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Outputs</th>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.A200</td>
<td>8 “make”</td>
<td>2 A/250 VAC</td>
<td>0.5 A</td>
</tr>
<tr>
<td>PCD2.A210</td>
<td>8 “break”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD2.A220</td>
<td>6 “make”</td>
<td>2 A/50 VDC</td>
<td>(2 × 3)</td>
</tr>
<tr>
<td>PCD2.A250</td>
<td>8 “make”</td>
<td>2 A/50 VDC</td>
<td>(2 × 4)</td>
</tr>
</tbody>
</table>

### Combined input/output module

<table>
<thead>
<tr>
<th>Model</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.B100</td>
<td>2 inputs, 2 transistor outputs and 4 selectable inputs or outputs, inputs 15…32 VDC source operation, outputs 5…32 VDC/0.5 A</td>
</tr>
</tbody>
</table>

### Spring terminal block

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminals</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>4’405’491’4’0</td>
<td>10</td>
<td>PCD2.M170 base unit</td>
</tr>
</tbody>
</table>

On request, the relevant modules can also be supplied ready assembled (Indicate on order: “with spring terminal block”).

### Electrical isolation of input or output signals

Electrical isolation can be achieved for the analogue modules with the KFD1 isolating amplifiers (see on page 9.7).

### You will get further information

You will get further information about the digital input/output modules from the Technical Information 26/358 and about the analogue input/output modules from the Technical Information 26/359.
Analogue input/output modules

**Analogue input modules**

with 4 input channels, resolution 12 bit
Signal range for all input channels, jumper selectable:

- **PCD2.W100**
  4 input channels 0...10 V, –10...0 V or –10...+10 V

- **PCD2.W105**
  4 input channels 0...20 mA, –20...0 mA or –20...+20 mA (4...20 mA via user program)

with 4 input channels for resistance thermometer, resolution 12 bit
Temperature range –50...+150 °C

- **PCD2.W110**
  4×Pt 100 each to 2 mA (IEC 751)
- **PCD2.W111**
  4×Ni 100 each to 2 mA (DIN 43 760)
- **PCD2.W112**
  4×Pt 1000 each to 0.2 mA (IEC 751)
- **PCD2.W113**
  4×Ni 1000 each to 0.2 mA (DIN 45 760)

Temperature range 0...+550 °C

- **PCD2.W114**
  4×Pt 100 each to 0.2 mA (IEC 751)

with 8 input channels, resolution 10 bit

- **PCD2.W200**
  8 input channels 0...10 V
- **PCD2.W210**
  8 input channels 0...20 mA
- **PCD2.W220**
  8 input channels for resistance thermometer Pt/Ni 1000 (2-wire), –50...+400 °C or +200 °C respectively
- **PCD2.W220 Z02**
  8 input channels for NTC 10 sensors
- **PCD2.W220 Z25**
  8 input channels for F-T30 sensors from Staefa Control
- **PCD2.W220 Z12**
  4 input channels 0...10 V and 4 input channels Pt/Ni 1000 (2-wire), –50...+400 °C or +200 °C respectively
- **PCD2.W220 Z15**
  4 input channels 0...10 V and 4 input channels for NTC 10 sensors KTF 20
- **PCD2.W220 Z29**
  4 input channels 0...10 V and 4 input channels for NTC 10 sensors KTF 20

with 8 input channels, resolution 12 bit
Temperature range –50...+150 °C

- **PCD2.W300**
  8 input channels 0...10 V
- **PCD2.W310**
  8 input channels 0...20 mA
- **PCD2.W340**
  8 input channels, jumper selectable: 0...10 V, 0...20 mA or for 2-wire resistance thermometer Pt 1000 for –50...+400 °C or Ni 1000 for –50...+200 °C

**PCD2.W350**
8 input channels for 2-wire resistance thermometer Pt 100 for –50...+600 °C or Ni 100 for –50...+250 °C

**PCD2.W360**
8 input channels for 2-wire resistance thermometer Pt 1000 for –50...+150 °C, resolution <0.1 °C

**Analogue output modules**

with 4 output channels, resolution 8 bit
Signal ranges (load impedance):

- **PCD2.W400**
  Simple module: 4 channels 0...10 V (≥3 kΩ)
- **PCD2.W410**
  Universal module: 4 channels, jumper selectable, 0...10 V (≥3 kΩ), 0...20 mA (≤500 Ω) or 4...20 mA (≤500 Ω)

with 4 output channels, resolution 12 bit

- **PCD2.W600**
  Simple module: 4 channels 0...10 V (≥3 kΩ)
- **PCD2.W610**
  Universal module: 4 channels, jumper selectable, 0...10 V and –10...+10 V (≥3 kΩ), 0...20 mA (≤500 Ω), additional “mid/low” jumper for closing sequence selection

with 8 output channels, resolution 10 bit

- **PCD2.W700**
  8 output channels 0...10 V
- **PCD2.W710**
  8 output channels 0...20 mA
- **PCD2.W720**
  8 output channels for resistance thermometer Pt/Ni 1000 (2-wire), –50...+400 °C or +200 °C respectively
- **PCD2.W720 Z02**
  8 output channels for NTC 10 sensors
- **PCD2.W720 Z25**
  8 output channels for F-T30 sensors from Staefa Control
- **PCD2.W720 Z12**
  4 output channels 0...10 V and 4 output channels Pt/Ni 1000 (2-wire), –50...+400 °C or +200 °C respectively
- **PCD2.W720 Z15**
  4 output channels 0...10 V and 4 output channels for NTC 10 sensors KTF 20
- **PCD2.W720 Z29**
  4 output channels 0...10 V and 4 output channels for NTC 10 sensors KTF 20

**Combined input/output modules**

with 2 input and 2 output channels, resolution 12 bit

- **PCD2.W500**
  2 input and 2 output channels for voltage signals
- **PCD2.W510**
  2 input channels for current signals and 2 output channels for voltage signals (special version, delivery on request)

**Spring terminal block**

4‘405’4914’0 with 10 terminals, only for use on PCD2.M170 base unit, can be inserted in place of standard screw terminal blocks

On request, the relevant modules can also be supplied ready assembled (Indicate on order: “with spring terminal block”).
Performance range PCD4


Transistor output module PCD4.A350 with 8 outputs 24 VDC/2 A

Combined input/output module PCD4.B900 with 16 inputs and 16 outputs

Digital input module PCD4.E600 with 16 inputs 24 VDC

Analogue input module PCD4.W500, electrically isolated, with 2 × 4 input channels

Analogue manual operation module PCD4.W800 with 8 output channels, display via 10-LED array
### Processor modules PCD4 differ as follows

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs/outputs or I/O module sockets</td>
<td>510&lt;sup&gt;1&lt;/sup&gt;</td>
<td>510&lt;sup&gt;1&lt;/sup&gt;</td>
<td>510&lt;sup&gt;1&lt;/sup&gt;</td>
<td>510&lt;sup&gt;1&lt;/sup&gt;</td>
<td>510&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Number of CPUs</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Processing time bit command word command</td>
<td>6 µs</td>
<td>4 µs</td>
<td>4 µs</td>
<td>4 µs</td>
<td>2 µs</td>
</tr>
<tr>
<td>35 µs</td>
<td>20 µs</td>
<td>20 µs</td>
<td>10 µs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field bus connections</td>
<td>SAIA®S-Bus</td>
<td>SAIA®S-Bus</td>
<td>SAIA®S-Bus</td>
<td>PROFIBUS FMS</td>
<td>PROFIBUS FMS PROFIBUS DP</td>
</tr>
<tr>
<td>Network connections</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>Ethernet-TCP/IP</td>
</tr>
<tr>
<td>User memory RAM standard equipment Expansion with RAM or EPROM</td>
<td>0...172 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0...172 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0...172 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0...172 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1024 KBytes</td>
</tr>
<tr>
<td>up to 428 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>up to 428 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>up to 428 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>up to 428 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>up to 428 KBytes&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1024 KBytes [.R400]</td>
</tr>
<tr>
<td>Date-time</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Data protection and power reserve for real-time clock</td>
<td>&gt;2 month (NiCd accus)</td>
<td>&gt;2 month (NiCd accus)</td>
<td>&gt;2 month (NiCd accus)</td>
<td>&gt;2 month (NiCd accus)</td>
<td>1–3 years with Lithium battery</td>
</tr>
<tr>
<td>Interrupt inputs or fast counter inputs</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>2</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1 kHz</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> With 32 × PCD4.B900 modules an I/O capacity of 512 I plus 512 O is achieved.

<sup>2</sup> Via central memory module with memory modules plugged on.
Performance range of the System PCD4

The PCD4 series is an extremely flexible system. From the minimum system with the simplest processor, one serial interface, a low-cost power supply module and 2 I/O modules, through to the fully equipped system with up to 32 I/O and function modules, processor module ..M170, up to 6 independent serial interfaces or SAlA®S-Bus, PROFIBUS FMS/DP or Ethernet-TCP/IP network connections. The system can be assembled in one go, or expanded in stages.

All modules are in the form of equal sized cassettes. Cassette modules are plugged into the appropriate bus modules. The bus modules are in turn snapped onto mounting rails and connected together to form the system bus. Connections to the external process are wired to the bus modules, which means that cassette modules can be inserted or removed without affecting the wiring.

General technical data

Central inputs/outputs
fit with any 32 I/O modules for up to 510 I/Os
(details for input/output modules starting from page 3.7)

Real-time clock
in basic assembly

Supply voltage
24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified

Power consumption
max. 48 W for 256 I/Os

Noise emission
CE mark according to EN 50081-1

Noise immunity
CE mark according to EN 5082-2

Ambient temperature
Operation 0...+55 °C or 0...+40 °C (depending on mounting position), storage -20...+85 °C

Atmospheric humidity
95 % r. H. without dew formation (DIN 40040, class F)

Mechanical strength
according to EN/IEC 61151-2

Standards/approvals
EN/IEC 61151-2, Germanischer Lloyd, Lloyd’s Register of Shipping, Det Norske Veritas, Polski Rejestr Statków, UL-USA, American Bureau of Shipping, UL-CDN

You will get further information about the PCD4 system from the Technical Information 26/366.
Processor modules PCD4.M..

**Processor module PCD4.M110**

User memory for programs, texts and data blocks
up to 428 KBytes as RAM and/or EPROM (details about
public memory modules and memory components see
next page)

**RAM data protection** (user memory, date-time)
>2 month with NiCd accu

**Processing time**
6 µs bit processing, 35 µs word processing

**Serial data port**
1× PGU/RS232 (SAIA®S-Bus connection via converter
PCD7.T120, details on page 9.8)

**Processor module PCD4.M125**

**Processing time**
4 µs bit processing, 20 µs word processing

**Serial data ports**
1× PGU/RS232 plus 1× RS232 (suitable for modem
connection), RS422/RS485 or TTY/current loop 20 mA via
combined bus module (details see next page)

**Field bus connection**
SAIA®S-Bus as master or slave, further bus connections
as EIB, Modbus, M-Bus, MP-Bus (BELIMO), GENibus
(Grundfos), etc. details starting from page 4.1.

Others technical data as ..M110

**Processor module PCD4.M145**

**Serial data ports**
1× PGU/RS232 plus 3× RS232 (suitable for modem
connection), RS422/RS485 or TTY/current loop 20 mA via
combined bus module (details see next page)

Others technical data as ..M125

**Dual processor module PCD4.M445**

**Field bus connection**
PROFIBUS FMS

Others technical data as ..M145

**Processor module PCD4.M170 F..**

User memory for programs, texts and data blocks
1 MByte RAM in basic assembly

**Flash-card PCD7.R400** (as option)
1 MByte for backup the user program

**RAM data protection** (user memory, date-time)
1–3 years with Lithium battery

**Processing time**
2 µs bit processing, 10 µs word processing

**Fast counters and interrupt inputs**
2, for interrupts or counting up to 1 kHz

**Serial data ports** via CPU bus module
1× PGU/RS232 plus 3× RS232 (suitable for modem
connection), RS422, RS485 or TTY/current loop 20 mA
(details about CPU bus module see next page, about
communication modules on page 4.8)

**Serial data ports** via socket B2
1× RS232 (suitable for modem connection), RS422, RS485
or 2× RS232 (details about communication modules on
page 4.8)

**Field bus connection** via socket B1 or B2
PROFIBUS FMS, PROFIBUS DP as master or slave (details
about connection modules on page 4.8)

**Ethernet-TCP/IP network connection** via socket B2
with connection module PCD7.F651 (details on page 5.1)

**Ordering information PCD4.M170 F..**

The PCD4.M170 Fnx processor module is supplied ready
configured: “n” defines the ..F.. module at socket B1 and
“x” defines the ..F.. module at socket B2.

<table>
<thead>
<tr>
<th>n (socket B1)</th>
<th>x (socket B2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = not equipped</td>
<td>0 = not equipped</td>
</tr>
<tr>
<td>1 = PCD7.F700</td>
<td>2 = PCD7.F750</td>
</tr>
<tr>
<td>2 = PCD7.F750</td>
<td>3 = PCD7.F770</td>
</tr>
<tr>
<td>3 = PCD7.F770</td>
<td>4 = PCD7.F772</td>
</tr>
<tr>
<td>4 = PCD7.F772</td>
<td>5 = PCD7.F520</td>
</tr>
<tr>
<td>5 = PCD7.F520</td>
<td>6 = PCD7.F522</td>
</tr>
<tr>
<td>6 = PCD7.F522</td>
<td>7 = PCD7.F651</td>
</tr>
<tr>
<td>7 = PCD7.F651</td>
<td>RS232/422, RS485</td>
</tr>
<tr>
<td>8 = PCD7.F522</td>
<td>RS232</td>
</tr>
<tr>
<td>9 = PCD7.F651</td>
<td>Ethernet</td>
</tr>
</tbody>
</table>
Flexible and modular mounting with bus modules

From a mechanical point of view, the bus modules form the backbone of the PCD4. There is a choice of different types of bus module onto which the cassette-style function modules are plugged, locked mechanically and electrically connected to the I/O or CPU bus.

The power supply modules and the processor modules are fitted to either the CPU bus module or the combined bus module. On the combined bus module three sockets are available that can be equipped, as required, with communications modules.

**CPU bus modules**

- **PCD4.C100** CPU bus module with 2 sockets for the power supply and the processor module, without additional serial data port
- **PCD4.C340** Combined bus module with sockets for processor module, power supply module, 4 I/O modules and 3 sockets for communication modules PCD7.F1..
  
  **Communication modules for plugging onto PCD4.C340**
  - **PCD7.F110** RS422/RS485 interface, electrically connected
  - **PCD7.F120** RS232 interface (suitable for modem connection)
  - **PCD7.F130** TTY/current loop interface 20 mA
  - **PCD7.F150** RS485 interface, electrically isolated
  - **PCD7.F180** MP-Bus connection module for 8 BELIMO® damper actuators and sensors

**Mechanical structure**

- Processor module PCD4.M..
- Power supply module PCD4.N2..
- 1 MByte Flash-card
- PGU connector (RS232)
- Interfaces B1 and B2
- CPU bus module PCD4.C100/..C340
- I/O modules PCD4.E/..A/..B/..W..
I/O bus modules

Every socket may accommodate modules of the types ..E.., ..A.., ..B.., ..W.. or ..H.. A connector to the preceding bus module is supplied with each I/O module.

**PCD4.C220** with 2 I/O module sockets

**PCD4.C260** with 6 I/O module sockets

Input/output modules on next page.

Bus extension cables

shielded, with screw-mounted connectors

**PCD4.K200** for 2-row mounting, up to max. 256 I/Os, length 100 cm

**PCD4.K210** for 2-row mounting, up to max. 256 I/Os, length 80 cm

**PCD4.K250** for 2-row mounting, more than 256 I/Os, length 56 cm

**PCD4.K260** for 3 and 4-row mounting, more than 256 I/Os, length 72 cm

Public memory modules and memory components to the processor modules

**PCD7.R110** Public memory module with 2 sockets for EPROM or RAM memory components up to 256 KBytes (for programs, texts and data blocks)

**PCD7.R310** Public memory module for up to 428 KBytes, equipped with 172 KBytes RAM (for texts and data blocks) and 2 sockets for additional EPROM or RAM memory components up to 256 KBytes (for programs, texts and data blocks)

Memory components
(2 chips required for each module)

- **4'502'541** 2 × RAM chip, 64 KBytes user memory
- **4'502'701** 2 × RAM chip, 256 KBytes user memory
- **4'502'532** 2 × EPROM chip, 64 KBytes user memory
- **4'502'395** 2 × EPROM chip, 128 KBytes user memory
- **4'502'712** 2 × EPROM chip, 256 KBytes user memory

Power supply modules

**PCD4.N200** basic version, for digital I/O modules only

Current consumption max. 2.5 A at 24VDC

Output current 4.0 A at +5VDC

**PCD4.N210** Power supply module with Run/Halt and Clear switches, for all digital and analogue I/O modules

Current consumption max. 2.5 A at 24VDC

Output current 4.0 A at +5VDC
0.5 A at +15VDC
0.45 A at –15VDC
### Overview of digital and analogue input/output modules

#### Digital input/output modules

<table>
<thead>
<tr>
<th>Type</th>
<th>Total I/Os</th>
<th>Input voltage</th>
<th>Breaking capacity</th>
<th>Input filter</th>
<th>Electrical isolation</th>
<th>Current draw ¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.E110</td>
<td>16 I</td>
<td>15…30 VDC</td>
<td>8 ms</td>
<td>no</td>
<td>typ. 25 mA</td>
<td></td>
</tr>
<tr>
<td>PCD4.E111</td>
<td>16 I</td>
<td>15…30 VDC</td>
<td>0.1 ms</td>
<td>no</td>
<td>typ. 25 mA</td>
<td></td>
</tr>
<tr>
<td>PCD4.E600</td>
<td>16 I</td>
<td>15…30 VDC</td>
<td>8 ms</td>
<td>yes</td>
<td>typ. 25 mA</td>
<td></td>
</tr>
<tr>
<td>PCD4.E601</td>
<td>16 I</td>
<td>15…30 VDC</td>
<td>0.3 ms</td>
<td>yes</td>
<td>typ. 25 mA</td>
<td></td>
</tr>
<tr>
<td>PCD4.B900</td>
<td>16 I + 16 O</td>
<td>18…35 VDC</td>
<td>9 ms</td>
<td>no</td>
<td>typ. 50 mA</td>
<td></td>
</tr>
<tr>
<td>PCD4.A400</td>
<td>16 O</td>
<td>0.5 A/5…32 VDC</td>
<td>no</td>
<td>typ. 25 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD4.A410</td>
<td>16 O</td>
<td>0.5 A/5…32 VDC</td>
<td>yes</td>
<td>typ. 25 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD4.A350</td>
<td>8 O</td>
<td>2 A/8…32 VDC</td>
<td>yes, with short-circuit protection</td>
<td>typ. 15 mA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹) Current draw from internal 5 V bus (depending on number of active input or output channels), loading capacity max. 4000 mA
²) Special: 5 VDC, 12 VDC, 48 VDC
³) Special: 5 VDC, 48 VDC

#### Analogue input/output modules

<table>
<thead>
<tr>
<th>Type</th>
<th>Total channels</th>
<th>Signal ranges</th>
<th>Resolution (conversion time)</th>
<th>Current draw ¹) ¹²)</th>
<th>Accuracy ¹³) ¹⁴)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.W300</td>
<td>8 I (2 × 4)</td>
<td>–10 V…+10 V / –10 V…+10 V / 0 V…+1 V / –1 V…+1 V / –100 mV…+100 mV</td>
<td>12 bit + sign bit ≤120 ms</td>
<td>30 mA 16 mA</td>
<td>±0.35 %</td>
</tr>
<tr>
<td>PCD4.W500</td>
<td>8 I (2 × 4)</td>
<td>0 V…+10 V / –10 V…+10 V / 0 V…+1 V / –1 V…+1 V / –100 mV…+100 mV</td>
<td>12 up to 15 bit ≤100 µs</td>
<td>150 mA 3 mA</td>
<td>±0.3 %</td>
</tr>
<tr>
<td>PCD4.W100</td>
<td>4 I (1 × 4)</td>
<td>0 V…+10 V / –10 V…+10 V / 0 mV…+10 V / –10 mV…+10 V / –100 mV…+100 mV</td>
<td>12 bit ≤30 µs</td>
<td>50 mA 35 mA</td>
<td>±0.5 % unipolar ±0.6 % bipolar</td>
</tr>
<tr>
<td>PCD4.W400</td>
<td>8 O (2 × 4)</td>
<td>0 V…+10 V / 0 mV…+20 mA / +4 mA…+20 mA</td>
<td>8 bit ≤55 µs</td>
<td>10 mA 30 mA</td>
<td>±1.5 % voltage ±2.0 % current</td>
</tr>
<tr>
<td>PCD2.W600</td>
<td>8 O (2 × 4)</td>
<td>0 V…+10 V / 0 V…+20 mA / +4 mA…+20 mA</td>
<td>12 bit ≤0.8 ms</td>
<td>200 mA 3 mA</td>
<td>±0.3 % voltage ±0.3 % current</td>
</tr>
</tbody>
</table>

¹) Current draw from internal 5 V bus, loading capacity max. 4000 mA
²) Current draw from internal 15 V bus, loading capacity max. 500 mA
³) for two-wire transducers
⁴) four wires
⁵) electrically isolated
⁶) +4…+20 mA via user program
# Digital input/output modules

## Digital input modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.E110</td>
<td>16 inputs 24 VDC, source or sink operation, input delay typ. 9 ms (pulsed voltage possible)</td>
</tr>
<tr>
<td>PCD4.E111</td>
<td>16 inputs 24 VDC, source operation, input delay typ. 0.1 ms (smoothed voltage required)</td>
</tr>
<tr>
<td>PCD4.E600</td>
<td>16 inputs 24 VDC, source operation, input delay typ. 6 ms (pulsed voltage possible)</td>
</tr>
<tr>
<td>PCD4.E601</td>
<td>16 inputs 24 VDC, source operation, input delay typ. 0.3 ms (smoothed voltage required)</td>
</tr>
</tbody>
</table>

## Combined input/output module

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.B900</td>
<td>with 16 inputs 18...35 VDC for source operation and 16 transistor outputs 5...32 VDC/0.5 A</td>
</tr>
</tbody>
</table>

## Additional set of front tags

<table>
<thead>
<tr>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4’310’8567’0</td>
<td>for address range 0...127</td>
</tr>
<tr>
<td>4’310’8568’0</td>
<td>for address range 128...254</td>
</tr>
<tr>
<td>4’310’8569’0</td>
<td>for address range 255...510</td>
</tr>
<tr>
<td>4’310’8570’0</td>
<td>for .W. modules</td>
</tr>
</tbody>
</table>

## Empty module housing

<table>
<thead>
<tr>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4’104’5195’0</td>
<td>to cover an unused socket on the bus module</td>
</tr>
</tbody>
</table>

## Transistor output modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.A350</td>
<td>8 outputs 5...32 VDC/2 A, electrically isolated</td>
</tr>
<tr>
<td>PCD4.A400</td>
<td>16 outputs 5...32 VDC/0.5 A, electrically connected</td>
</tr>
<tr>
<td>PCD4.A410</td>
<td>electrically isolated</td>
</tr>
</tbody>
</table>

## Relay output modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD4.A200</td>
<td>Rupturing capacity 2A/250 VAC or 2A/50 VDC with 8 “make” contacts</td>
</tr>
<tr>
<td>PCD4.A250</td>
<td>with 16 “make” contacts (4 × 4)</td>
</tr>
</tbody>
</table>
Analogue input modules

PCD4.W300 Basic module for 1 or 2 plug-in range modules, resolution 12 bit + sign bit, electrically connected, A/D conversion time max. 120 ms

PCD4.W500 Basic module for 1 or 2 plug-in range modules, resolution 12...15 bit, electrically isolated, input filter 1 ms

Plug-in range modules for ..W300 and ..W500

PCD7.W100 4 channels ±10 V or 4 Pt/Ni 1000 (four wires)
PCD7.W101 4 channels ±1 V or 4 Pt/Ni 100 (four wires)
PCD7.W102 4 channels ±100 mV (only for ..W500)
PCD7.W103 4 channels ±20 mA or 4...20 mA
PCD7.W104 4 channels 4...20 mA for two-wire transducers
PCD7.W110 4 channels Pt 1000 (two wires), –50...+150 °C, resolution 0.1 °C
PCD7.W111 4 channels Ni 1000 (two wires), –50...+150 °C, resolution 0.1 °C
PCD7.W120 4 stabilized current outputs of 2 mA for 4 Pt/Ni 100 and Pt/Ni 1000 resistance thermometer (four wires)

Other signal ranges on request

Electrical isolation of input or output signals

Electrical isolation can be achieved for the analogue modules with the KFD1 isolating amplifiers (see on page 9.7).

Analogue output modules

PCD4.W400 8 (2×4) output channels, resolution 8 bit electrically connected, signal ranges (load impedance) can be allocated by jumper in groups of 4: 0...10 V (≥5kΩ), 0...20 mA (≤500Ω) or 4...20 mA (≤500Ω)

PCD4.W600 Basic module for 1 or 4 plug-in range modules, resolution 12 bit, electrically isolated, D/A conversion time 0.1...0.8 ms

Plug-in range modules for ..W400

PCD7.W300 2 output channels 0...10 V (≥5kΩ)
PCD7.W302 2 output channels ±10 V (≥5kΩ)
PCD7.W304 2 output channels 0...20 mA (≤500Ω)
PCD7.W305 2 output channels 4...20 mA (≤500Ω)

Combined input/output module

PCD4.W100 Basic module for plug-in range modules, resolution 12 bit, input filter 1 ms, D/A conversion time max. 20 µs

Plug-in range modules, 1×4 input channels

PCD7.W101 0...10 V, ±10 V, ±5 V or 2×Pt/Ni 1000 (four wires) plus 2×0...10 V
PCD7.W105 0...20 mA, ±20 mA, ±10 mA (4...20 mA via user program)

Plug-in range modules, max. 2×1 output channels

PCD7.W200 0...10 V (≥5kΩ)
PCD7.W201 0...1 V (≥500kΩ)
PCD7.W202 ±10 V (≥5kΩ)
PCD7.W203 ±1 V (≥500kΩ)
PCD7.W204 0...20 mA (≤500Ω)
PCD7.W205 4...20 mA (≤500Ω)
PCD7.W206 –10...0 V (≥5kΩ)
Manual operation modules with manual override

In order to guarantee the necessary trouble-free manual override, specific manual operation modules have been developed for the PCD4 series. These modules are based on digital and analogue output modules, which are activated either via the user program or via manual switches. Like all I/O modules, the manual operation modules are plugged onto the PCD4.C2..I/O bus modules (.C225 for coupling to PCD2 series).

The manual operation modules offer the following advantages:

- The independent 24 VDC supply ensures manual operation of the installation under emergency override in case of controller failure.

- Additional wiring between standard output modules and a separate manual/emergency override level is not necessary, since all these functions are combined in the same module.

- Jumpers make it possible to determine the action (passive - on - off) of individual output channels if an alarm signal should arise (1 alarm input per module).

- The function states are indicated by LEDs on the front panel. Space on the label field allows individual information to be written. The manual switch positions and the status of outputs can be read at any time by the CPU via the I/O bus.

**Digital, single-stage manual operation module**

PCD4.A810  8 relay outputs 2 A/250 VAC or 2 A/50 VDC (ohmic)
“make” contacts with contact protection, switch positions Auto - Man 0 - Man 1

**Digital, dual-stage manual operation module**

PCD4.A820  4 × 2 relay outputs, 2 A/250 VAC or 2 A/50 VDC (ohmic)
“make” contacts with contact protection, switch positions Auto / Man 1 - Man 0 - Man 2

**Analogue manual operation module**

PCD4.W800  4 output channels, short-circuit proof, resolution 8 bit
Signal range (load impedance) jumper selectable: 0...10 V (≥ 5 kΩ), 0...20 mA (≤ 500 Ω) or 4...20 mA (≤ 500 Ω), switch positions Auto - Man, potentiometer 0...100%, Display 10-LED array
PCD6 – the multiprocessor control device with many communications ports

**Modular rack construction**

From the minimum system with one rack unit, a single processor module and no more than 255 I/Os, to the fully-equipped multi processor system with 5100 I/Os, it can all be realized with the PCD6.

The system fits into a standard 19" rack unit, containing the power supply module and up to 6 processor modules or up to 255 I/O addresses. A single floor-standing rack housing provides space for 5 rack units or 1275 I/O addresses. The use of connection modules permits the multi processor system to be expanded to 5100 I/Os in max. 20 rack units.

A central function is assumed by the public memory module, which is available to all processor modules. This module not only incorporates the entire user memory (programs, texts and data blocks) on RAM and/or EPROM, but also all user media (flags, timers, counters, registers and the real-time clock) on batterybacked RAM memory.

An important element of the public memory module is the bus “arbitrator”, which monitors and controls access to the bus by the individual processor modules. The arbitrator operates so efficiently that no significant reduction in processing speed is discernible with up to 5 processor modules.

**Technical data**

<table>
<thead>
<tr>
<th>Model</th>
<th>Multi processor system PCD6.M300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central inputs/outputs</td>
<td>up to 5100 I/Os in up to 20 rack units</td>
</tr>
<tr>
<td>User memory</td>
<td>up to 1 MBytes as RAM and/or EPROM for programs, texts and data blocks</td>
</tr>
<tr>
<td>RAM data protection (user memory, date-time)</td>
<td>&gt;2 month with NiCd accu</td>
</tr>
<tr>
<td>Real-time clock</td>
<td>in basic assembly</td>
</tr>
<tr>
<td>Processor</td>
<td>up to 6 processor modules with 32bit µC 68349</td>
</tr>
<tr>
<td>Processing time</td>
<td>2 µs bit processing, 10 µs word processing</td>
</tr>
<tr>
<td>Serial data ports</td>
<td>4+1(PGU) per processor module, interfaces accepts insertion of RS 232, RS 422/RS 485, TTY/current loop 20 mA</td>
</tr>
<tr>
<td>Field bus connections</td>
<td>SAIA®S-Bus or PROFIBUS FMS and DP as master or slave, Ethernet-TCP/IP</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>24 VDC ±20% smoothed or 19 VAC ±15% full-wave rectified, 250 VAC and 115 VAC, −15%/+10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>max.150W or 150VA per rack</td>
</tr>
<tr>
<td>Noise emission</td>
<td>CE mark according to EN 50081-1</td>
</tr>
<tr>
<td>Noise immunity</td>
<td>CE mark according to EN 5082-2</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Operation 0...+55°C, storage −20...+85°C</td>
</tr>
<tr>
<td>Atmospheric humidity</td>
<td>95 % r. H. without dew formation (DIN 40040, class F)</td>
</tr>
<tr>
<td>Mechanical strength</td>
<td>according to EN/IEC 61131-2</td>
</tr>
</tbody>
</table>

Weitergehende Informationen können der Dokumentation 26/209 entnommen werden.
References from the building automation

Reconstruction of the technical installations of a central building and on more than 40 individual accommodations

The versatile automation systems SAIA® DDC-PLUS serve as gateways and for the work-overlapping functions in the substations. The selection of PROFIBUS FMS as primary bus and PROFIBUS FMS and DP respectively as direct separated secondary bus guarantees a clear separation between the communication to the building management system FactoryLink® and the local communication to the various substations. More distant accommodations are integrated via ISDN adapter.

You will find detailed information in the reference-documentation 26/928.

Renovation of the complete building automation system in a hospital

Continuous change of the complete building automation system from an obsolete system to a modern automation system that can be programmed. Use of the SAIA®S-Bus as communication path between the 60 DDC-PLUS stations and the building management system UNIVIEW.

You will find detailed information in the reference-documentation 26/921.
Configuration example:
Installation of the medium extension with text terminal and modem-connection

Controller PCD2.M120 without or with extension device respectively
for 7 or 15 module sockets for data points which can be used optionally

Configuration of devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.M120</td>
<td>Base unit with 8 I/O module sockets [details on page 2.6]</td>
</tr>
<tr>
<td>PCD2.C100</td>
<td>Expansion housing for 8 additional I/O modules [details on page 2.9]</td>
</tr>
<tr>
<td>PCD2.K100</td>
<td>Expansion cable for mounting beneath each other [details on page 2.9]</td>
</tr>
<tr>
<td>PCD7.T813</td>
<td>Analogue modem module ¹) with 33.6 kbps [details on page 4.10]</td>
</tr>
<tr>
<td>PCD2.E../A../W..</td>
<td>Input/output modules ²) [details starting from page 2.10]</td>
</tr>
<tr>
<td>PCD2.D202</td>
<td>Terminal for front panel flush mounting with display of 4×20 characters [details on page 7.13]</td>
</tr>
<tr>
<td>PCD2.F520</td>
<td>Communications module with RS232 and RS485/RS422 [details on page 4.8]</td>
</tr>
<tr>
<td>PCD7.K422</td>
<td>Interface connecting cable [details on page 7.12]</td>
</tr>
</tbody>
</table>

¹) In case of use of the internal modem PCD7.T813 the communications module PCD7.F120 which is needed for the connection of an external modem is not necessary. The internal modem occupies directly the port 1. For ISDN communication the modem module PCD7.T850 can be used.

²) The modem module occupies an I/O module socket, thus, for further data points there are still 7 I/O module socket in the base unit and 8 I/O module socket in the expansion housing.
Configuration example:
Installation with building management system and field bus

Controller PCD2.M170 with connection of the building management system through a point-to-point connection

Connection of the field bus LonWorks® for external systems and of a SAIA®S-Bus network for room controllers and RIO modules

Configuration of devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.M170</td>
<td>Base unit with 8 I/O module sockets</td>
<td>(details on page 2.7)</td>
</tr>
<tr>
<td>PCD2.E../A../W..</td>
<td>Input/output modules</td>
<td>(details starting from page 2.10)</td>
</tr>
<tr>
<td>PCD7.F802</td>
<td>LonWorks® connection module with additional RS 485 serial port, electrically connected</td>
<td>(details on page 4.8)</td>
</tr>
<tr>
<td>PCD7.F110</td>
<td>Communications module with RS 485/RS 422</td>
<td>(details on page 4.8)</td>
</tr>
<tr>
<td>PCD7.L..</td>
<td>Single-room controller DDC-PLUS ROOM</td>
<td>(details on page 5.7), remote input/output modules DDC-PLUS SBUS-RAIL/SBUS-SAFE</td>
</tr>
</tbody>
</table>
SAIA® DDC-PLUS
for the intelligent networking of all facilities
What “language” do you speak?
The SAIA® DDC-PLUS automation system, with its modular hardware, operating system, comprehensive software library and many standard bus connections, also offers a wealth of “languages”. Moreover, in collaboration with major manufacturers of field devices, proprietary bus systems are also supported.

Telecommunication provides an up-to-date way of overcoming distances and saving costs.
Which standard would you like?

DDC-PLUS-systems are supporting, as far as communication is concerned, all standards as well as specialities of building automation.
References from building automation

Reconstruction of the building automation in a large office building

For the sectors heating, air conditioning, lighting, roller gates, door closing installation, fire indication installation as well as for electric top load optimising a total of 8 SAIA®PCD4 and 2 SAIA®PCD2 is used. The 4400 information points are connected through the building management system system INGA-IBS® with the 3 control points in the central administration and with the 4 external accommodations. The communication with external service points is made by SMS.

You will find detailed information in the reference-documentation 26/927.

Fresh air and dry tunnels in the underground

The control and supervision of all technical installations for fresh air, infiltrating water and sewage as well as for moving staircases and for the personal lifts on various stations of the underground is guaranteed by more than 100 individual controls SAIA®PCD.

You will find detailed information in the reference-documentation 26/922.
Configuration example: Network installation with BACnet-server

Controller with a BACnet-server for the room automation and with a further BACnet-server for the basic sector of the building automation

Building management system
[e.g. ViSi-PLUS with OPC]

BACnet on Ethernet (or BACnet on IP)

P1-16447-133E for the room automation
(heating/cooling, ventilation, lighting and blinds)

PCD7.F110

Room 1

SAA’s Bus/RS485

PCD7.F110

Room 2

SAA’s Bus/RS485

P1-16447-133E for the building automation

e.g. air conditioning

e.g. sanitation

e.g. heating

Configuration of devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1-16447-133E</td>
<td>BACnet-server for up to 500 data points and BACnet on Ethernet PC/104 level completely pre-confectioned (details on page 4.11)</td>
</tr>
<tr>
<td></td>
<td>PCD-level identical with PCD2.M150, i.e. with 8 I/O modules (details on page 2.6)</td>
</tr>
<tr>
<td>PCD1/PCD2</td>
<td>Base units (details starting from page 2.1)</td>
</tr>
<tr>
<td>PCS1</td>
<td>Compact controller DDC-COMPACT (details on page 1.7)</td>
</tr>
<tr>
<td>PCD2.E../A../W..</td>
<td>Input/output modules (details starting from page 2.10)</td>
</tr>
<tr>
<td>PCD7.F110</td>
<td>Communications module with RS485/RS422 (details on page 4.8)</td>
</tr>
<tr>
<td>PCD7.L..</td>
<td>Single-room controller DDC-PLUS ROOM (details on page 5.7), remote input/output modules DDC-PLUS SBUS-RAIL/SBUS-SAFE (details on page 5.7)</td>
</tr>
</tbody>
</table>
Configuration example:
Comprehensive bus-communication

Connection of two bus systems to a controller with terminal
Realizes the communication of two different bus systems with a controller. On this way also the exchange of data between these two independent bus systems is possible.

Configuration of devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.M170</td>
<td>Base unit with 8 I/O module sockets</td>
<td>details on page 2.7</td>
</tr>
<tr>
<td>PCD7.F800</td>
<td>LONWORKS® connection module</td>
<td>details on page 4.8</td>
</tr>
<tr>
<td>PCD7.F650</td>
<td>Ethernet-TCP/IP connection module</td>
<td>details on page 5.4</td>
</tr>
<tr>
<td>PCD7.F120</td>
<td>Communication module with RS 232</td>
<td>details on page 4.8</td>
</tr>
<tr>
<td>PCD2.E../A../W..</td>
<td>Input/output modules</td>
<td>details starting from page 2.10</td>
</tr>
<tr>
<td>PCD7.D250</td>
<td>Industrial text terminal with display of 8 × 40 or 4 × 20 characters</td>
<td>details starting from page 7.12</td>
</tr>
<tr>
<td>PCD7.K422</td>
<td>Interface connecting cable</td>
<td>details on page 7.12</td>
</tr>
<tr>
<td>PCD7.L..</td>
<td>Single room controller and room control unit DDC-PLUS ECO</td>
<td>details on page 6.6, remote input/output modules DDC-PLUS LON-RAIL/LON-SAFE</td>
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</tbody>
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PCS1
PCS1

Communication
### Overview of systems and communication modules

Base units or processor modules and sockets for communications modules

<table>
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<tbody>
<tr>
<td>PCD1.C8..</td>
<td>A</td>
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</tr>
<tr>
<td>PCD1.M110</td>
<td>B</td>
<td>Port 0 (PGU), RS 232</td>
<td>Port 1, RS 485 (built-in)</td>
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<tr>
<td>PCD1.M120</td>
<td>B</td>
<td>Port 0 (PGU), RS 232</td>
<td>Port 1</td>
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<tr>
<td>PCD1.M130</td>
<td>-</td>
<td>Port 0 (PGU), RS 232</td>
<td>Port 1</td>
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<tr>
<td>PCD2.M110</td>
<td>B</td>
<td>Port 0 (PGU), RS 232/RS 485</td>
<td>Port 1</td>
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</tr>
<tr>
<td>PCD2.M120</td>
<td>B</td>
<td>Port 0 (PGU), RS 232/RS 485</td>
<td>Port 1</td>
<td>-</td>
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</tr>
<tr>
<td>PCD2.M150</td>
<td>-</td>
<td>Port 0 (PGU), RS 232/RS 485</td>
<td>Port 1</td>
<td>-</td>
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</tr>
<tr>
<td>PCD2.M250</td>
<td>-</td>
<td>Port 0 (PGU), RS 232/RS 485</td>
<td>Port 1</td>
<td>-</td>
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<tr>
<td>PCD2.M170</td>
<td>-</td>
<td>Port 0 (PGU), RS 232/RS 485</td>
<td>Port 1</td>
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<tr>
<td>PCD4.M110</td>
<td>-</td>
<td>Port 0 (PGU), RS 232</td>
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<tr>
<td>PCD4.M125</td>
<td>-</td>
<td>Port 0 (PGU), RS 232</td>
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<tr>
<td>PCD4.M145</td>
<td>-</td>
<td>Port 0 (PGU), RS 232</td>
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<tr>
<td>PCD4.M170</td>
<td>-</td>
<td>Port 0 (PGU), RS 232</td>
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<tr>
<td>PCD4.M445</td>
<td>-</td>
<td>Port 0 (PGU), RS 232</td>
<td>-</td>
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<tr>
<td>PCD6.M300</td>
<td>-</td>
<td>Port 0 (PGU), RS 232 (PGU = Port 4)</td>
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</tr>
</tbody>
</table>

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1) Suitable for modem connection due to provision of 6 control lines (PCD7.F120 on PCD4 always plugs onto socket A1), is not possible with PCD1.C8..  
2) Can be fitted, but the extra port is not available.  
3) For PCD1.M130 at socket A with special housing cover 4’104’7410’0 or as configured system with type number PCD1.M125F650.  
4) Plus 5 slots for PC/104 boards.  
5) For PCD2.M150 at socket B(1) with special housing cover 4’104’7410’0 or as configured system with type number PCD2.M150F650.  
6) The following combinations are not possible: 2 × PROFIBUS DP slave or 2 × LONWORKS®  
8) The PCD4.M170 is recommended for PROFIBUS FMS.  
9) With adapter set 4’639’4892’0 (configured CPU on request)
Each DDC-PLUS system provides a number of interfaces which can be configured optionally. As plug-in module they can be chosen from type RS 252, RS 422, RS 485 or current loop 20 mA. The programming interface on the DDC substation can also be used for user-specific communication tasks. The transmission rates of these standard interfaces are adjustable up to 38 400 bit/s (current loop up to 9600 bit/s).

Serial data ports

- **Socket A**
  - **PCD7.F110**: RS 422 with RTS/CTS or RS 485 electrically connected, with line termination resistors capable of activation, suitable for SAIA®-S-Bus
  - **PCD7.F120**: RS 232 with RTS/CTS, DTR/DSR, DCD, suitable for modem connection (is not possible with PCS1)
  - **PCD7.F130**: TTY/current loop 20 mA (active or passive), is not available with PCS1
  - **PCD7.F150**: RS 485 electrically isolated, with line termination resistors capable of activation, suitable for SAIA®-S-Bus

MP-Bus connection module

- **Socket A**
  - **PCD7.F100**: Possibility of connecting an MP-Bus branch with 8 actuators and sensors.

Details on page 6.11

Serial data ports

- **Socket B, B1 and/or B2**
  - **PCD2.F520**: RS 252 with RTS/CTS and RS 422 without RTS/CTS or RS 485 electrically connected
  - **PCD2.F522**: choice possible between 2 × RS 252 with RTS/CTS or 1 × RS 252 full with RTS/CTS, DTR/DSR, DCD, suitable for modem connection
  - **PCD2.F530**: RS 252 with RTS/CTS and RS 422 without RTS/CTS or RS 485 electrically connected and 6-digit display (for PCD2.M120 and ..M150 only)
  - **PCD7.D163**: Small terminal with RS 422/RS 485 interface (details on page 7.11)

Display module

- **Socket B** (for PCD2.M120 and ..M150 only)
  - **PCD2.F510**: 6-digit LED display, can be used to indicate process data and operating states directly

Communications, modem and display modules

PROFIBUS connection modules

- **Socket B(1) and/or B2**
  - **PCD7.F700**: PROFIBUS FMS/BA profile
  - **PCD7.F750**: PROFIBUS DP as master
  - **PCD7.F770**: PROFIBUS DP as slave
  - **PCD7.F772**: PROFIBUS DP as slave + electrically isolated RS 485 serial port
  - **PCD7.D164**: Small terminal with PROFIBUS DP connection (as slave) + electrically connected RS 485 serial port (details on page 7.11)
  - Details on wiring see page 6.9

LonWorks® connection modules

- **Socket B(1) and/or B2**
  - **PCD7.F800**: LONWORKS® network
  - **PCD7.F802**: LONWORKS® network + electrically connected RS 485 serial port
  - **PCD7.D165**: Small terminal with LONWORKS® connection + electrically connected RS 485 serial port (details on page 7.11)

Ethernet-TCP/IP connection module

- **Socket B** or **B2**
  - **PCD7.F650**: Intelligent interface module for connection to Ethernet-TCP/IP

Details on page 5.1

Modem modules

For use on I/O module sockets with PCD1/PCD2:

- **PCD2.T813**: Analogue modem 33.6 kbps (RS 232- und TTL-Schnittstelle)
- **PCD2.T850**: Digital modem ISDN-TA (RS 232 and TTL interface)

Details on page 4.9

For use with PCS1:

- **4'636'6683'0**: Analogue modem 33.6 kbps (RS 232 and TTL interface)
- **4'636'6684'0**: Digital modem ISDN-TA (RS 232 and TTL interface)
- **4'636'6749'0**: GSM (in preparation)

Details on page 1.8
Telecommunication – the up-to-date way to overcome distances and save costs

Modern telecommunication, when combined with DDC-PLUS systems, not only allows cost savings on commissioning and maintenance, but at the same time increases installation safety, availability and profitability. Examples of how this can be achieved include:

- remote support during commissioning
- event or time-controlled information and requests to operators or service personnel
- fault rectification by remote diagnosis
- process optimization through software updates and/or the updating of process parameters
- efficient, preventive maintenance by qualified specialists, resulting in low maintenance costs
- remote user support directly on-screen and close to operations

**Software libraries**

**Modem Basic**
Initialization and diagnosis, user profiles, list of call numbers, password protection, establishing connection, event or time-controlled data transmission and reception between DDC-PLUS systems and foreign devices (e.g. building lead system), SAIA®-S-Bus network via modem connections.

**Modem Pager**
Event or time-controlled transmission of single or multiple messages by pager, TAP and various country-specific protocols are supported

**Modem SMS**
Event or time-controlled transmission of single or multiple SMS short messages, UCP and TAP are supported

**Modem DTMF**
Supports reception of DTMF signals for control commands via telephone

You will get further information from the Technical Information 26/368.

**Master Station**
The master station calls one of two slave stations.
When a connection is present, data can be read or written with send and receive FBoxes.

**Slave Station 1**
The slave station needs no special modem program.
Configuration of the modem connection in the hardware settings in the PG5 is perfectly adequate.

If the slave station’s modem is also used for other functions, such as SMS or DTMF, the Modem Driver 12 FBox must be used rather than the hardware settings. Compare with slave station 2.
Industrial analogue and digital modem modules economically integrated into PCD1/PCD2 and PCS1

Characteristics of modem modules

- The economical, powerful and flexible solution for a virtually unlimited field of application in remote data transmission.
- Analogue and digital (ISDN-TA) and GSM (for PCS1) versions that meet today’s standards.
- Integrated directly within the controller, no external power supply is required.
- Easy installation and commissioning (plug-and-play).
- Connection to PCD with ribbon cable via port 1 (not with PCS1).
- Connection to telephone network with standard RJ11/RJ45 telephone connector.
- Possibility of operating two modems simultaneously (not with PCS1).

Technical data for analogue modem

Data transmission: V.54+, V.54, V.32bis, V.22, V.21, V.25, BELL-NORM 102, 212
Data compression: MNP2-4, V.42, LAPM, MNP10, MNP10 EC
Functions: expanded AT instruction set, automatic call acceptance, watchdog and reset

Technical data for digital modem ISDN-TA

Data transmission
B channel: V.110, V.120, x.75, PPP, X.25/X.31, ML-PPP, HDLC (transparent)
D channel: 1TR6, DSS1, National1,5ESS, JATE (INS64), VN4, TPH1962, X.51
ISDN interface: S0/I.450
Functions: expanded AT instruction set

General data

Power supply: 5VDC (max. 250 mA), internal from PCD I/O bus
Connections Modem→PCD:
RS252/TTL interface via ribbon cable at Port 1 (direct, without PCD7.F120) or RS232 interface via spring terminals to any choice of RS232 port
Modem→telephone network:
standard RJ11/RJ45 telephone connector
Function indication: LEDs to indicate data transmission (TXD, RXD, DTR, DCD), not with PCS1.
Approvals: throughout Europe according to CTR21, compliance with the valid CE guidelines
Ambient temperature: operating: 0…+55°C

Ordering details

PCD2.T813 Analogue modem 33.6 kbps
PCD2.T850 Digital modem ISDN-TA

4'636'6683'0 Analogue modem 33.6 kbps
4'636'6684'0 Digital modem ISDN-TA
4'636'6749'0 GSM (in preparation)

PCD9.M59 BAS M5 Modem Basic
PCD9.M59 PAG M5 Modem Pager
PCD9.M59 SMS M5 Modem SMS
PCD9.M59 DTMF M5 Modem DTMF

Slave Station 2
The slave station does not just accept calls from the master, but can also call the PG5 programming software, if necessary.
The BACnet server is based on the proven hardware platform of the PCD2.M250. With the integration of P140-components on different hardware platforms up to 2000 BACnet objects can be administered in the server. The operating system ONX guarantees an industry-usable and safe operation of the BACnet driver. The network connection on the BACnet side is made through standard Ethernet according to ISO 8802-5 or BACnet/IP.

As the server was ported onto the basis of the PCD2.M250 it can be used as standard automation station. Furthermore through the gateway master channel of the SAIA® S-Bus additional automation stations, individual peripheral systems or even room control systems can be connected (see example-drawing below). Technical details concerning PCD2.M250 on page 2.8.

**BACnet Conformance Classes**

BACnet defines 6 different Conformance Classes. Each Conformance Class describes BACnet functions which are supported either as Client (initiate) or as server (execute). The Classes are classified hierarchically, i.e. each Class being supported also supports all smaller Classes.

**Classes supported by the SAIA® BACnet server**

Class 3 as well as the Functional Groups, Event Initiation, COV Event Initiation, Calendar and Scheduler from Class 4. All BACnet services are supported as Client and Server.

Saia-Burgess Controls steadily expands the functions of the SAIA® BACnet server. Information can be taken from the updated list „BACnet Protocol Implementation Conformance Statement (PICS)“ which is provided by the respective national representation.

**Projecting software**

The projecting software is used for imaging the PCD resources on BACnet objects. A PCD resource always corresponds to the “Present Value” of a BACnet object.

**PCD resources**

First of all the PCD resources are defined in the windows shown on the next page. Which are to be imaged on the BACnet objects. As the server allows the access to a connected SAIA® S-Bus network in case of giving the resources also the station address must be given.

**Supported PCD resources**

Registers, timers/counters, inputs/outputs, flags, displays, error indications, firmware version, PCD status, date-time
The fixing of the BACnet objects is done according to the BACnet standard with all the object parameters. PCD resources can be imaged onto the following BACnet objects.

Supported BACnet objects

<table>
<thead>
<tr>
<th>BACnet object</th>
<th>Multi-State Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input</td>
<td>Multi-State Input</td>
</tr>
<tr>
<td>Analog Output</td>
<td>Multi-State Output</td>
</tr>
<tr>
<td>Analog Value</td>
<td>Notification Class</td>
</tr>
<tr>
<td>Binary Input</td>
<td>Multi-State Value</td>
</tr>
<tr>
<td>Binary Output</td>
<td>Calendar</td>
</tr>
<tr>
<td>Binary Value</td>
<td>Scheduler</td>
</tr>
</tbody>
</table>

In the link up window of the projecting software the PCD resources are connected with the “Present Value” of the BACnet object and the data direction is identified.

SAIA®ViSi-PLUS as BACnet-compatible building management system

By using a BACnet-OPC Server in the building management system all the BACnet objects can be worked and visualised by an OPC Client. ViSi-PLUS has got an OPC Client in three expansions so that through the right OPC Server every wanted automation station can be connected to the building management system.

Ordering details

- **P1-16447-133E** for a maximum of 500 data points with BACnet on Ethernet/ISO 8802-3
- **P1-17447-266E** for a maximum of 2000 data points with BACnet on Ethernet/ISO 8802-3
- **P1-16447-133T** for a maximum of 500 data points with BACnet/IPv4
- **P1-17447-266T** for a maximum of 2000 data points with BACnet/IPv4

¹ e.g. from MBS/Krefeld (http://www.mbs-software.de)
SAIA®S-Bus with multimaster functionality via Ethernet-TCP/IP

Substantial advantages from the use of SAIA®S-Bus via Ethernet-TCP/IP

- **Time saved in project planning, programming, commissioning and maintenance** via Ethernet-TCP/IP, due to
  - central access with PG5 or ViSi-PLUS to all DDC stations in the Ethernet,
  - convenient programming with PG5 editors
  - the same user programs and program structures for all DDC-PLUS systems
  - fast program download via Ethernet

- **S-Bus with multimaster functionality** via Ethernet-TCP/IP allows:
  - event-controlled data transfer in real time
  - reduced loading of network, even for very large installations
  - connection of several programming devices with the PG5 to the same network
  - connection of several SCADA systems with access to the same DDC stations

- **With the gateway functionality** of SAIA®S-Bus, several S-Bus subnets can be integrated within one Ethernet. As a result, the maximum number of S-Bus stations is no longer limited to 254, instead a multiple of that number can operate in one composite network. Details on gateway functionality on page 5.6.

- The simple, economical way of integrating the familiar field bus systems (PROFIBUS FMS, PROFIBUS DP, LonWorks®, etc.) into an Ethernet. With the PCD’s ..M170 CPUs, two intelligent communications modules can be used at the same time.

- **Universal connectivity** due to the OPC server (OLE for process control) and DLL libraries for connections of a foreign building lead system.

- **For data exchange with foreign systems**, TCP or UDP data frames are transmitted in a transparent form. In this way the user can also implement specific application protocols.

- **Intelligent co-processor module** with fast dual-port RAM interface to CPU. The module is plugged onto the large socket B (not with PCS1).

You will get further information from the Technical Information 26/356.
Technical data and ordering details

### Technical data

**Ethernet connection**
- **Standard:** IEEE 802.3
- **Connection:** 10 Base-T/100 Base-TX, RJ45 (category 5)
- **Speed:** 10/100 MBit/s (autosensing)

**Communications protocols and services**
- **Transport protocol:** TCP/IP or UDP/IP
- **SAIA®S-Bus:** with UDP/IP for PG5 ⇔ PCD communication
- **PCD** ⇔ **PCD** multimaster communication
- **SCADA** ⇔ **PCD** communication

**TCP or UDP**
- Transmission and reception of data frames for communication with foreign systems or for the implementation of other applications protocols.

**Project planning software**
- PG5 from version 1.1

**PCD systems supported**
- PCD1.M150
- PCD2.M150 and ..M170

**Mechanical construction**
- **Dimensions:** 84 × 71 × 15 mm (W × H × D)
- **Mounting:** in socket B or B2

**Power supply**
- **Internal supply:** typ. 250 mA from 5 V bus

**Operating conditions**
- **Ambient temperature:** Operation: 0...+55 °C
- **Storage:** –20...+85 °C
- **Noise emission:** according to EN 50081-1
- **Noise immunity:** according to EN 50081-2

### Ordering details

- **PCD1.M130F650**
  - PCD1 configured system with Ethernet module

- **PCD2.M150F650**
  - PCD2 configured system with Ethernet module

- **PCD4.M170 F..**
  - PCD4 configured CPU (for details see page 3.4)

- **PCD7.F650**
  - Ethernet module for PCD1/PCD2

- **PCD7.F651**
  - Ethernet module for PCD4/PCD6

- **4’639’4892’0**
  - Adapter set for PCD6.M300 due to PCD7.651 Ethernet module (front panel with RJ45 connector and adapter)

- **4’104’7409’0**
  - Cover for PCD1.M150 with space cut out for RJ45 connector

- **4’104’7410’0**
  - Cover for PCD2.M150 with space cut out for RJ45 connector

- **PCD8.C59010E1**
  - DLL library for Win 95/98 and NT/2000

- **26/776 E**
  - Manual
SAIA®S-Bus – the master-slave network for operational data, visual display and programming

SAIA®S-Bus – more than just a bus system

- **SAIA®S-Bus** is the system protocol of SAIA® controllers and included as standard in every CPU. It can be used on a variety of physical transmission media (RS232, RS485, RS422, TTY/current loop 20 mA, Ethernet-TCP/IP, modem, LWL, ...).
- Simultaneous use at several interfaces is supported.
- Optimized for data exchange and programming. Access with the PG5 tool for programming, debugging and commissioning is equally supported, as is the exchange of data between PCD controllers.
- Economical realization of master/slave networks with the simple RS485 twowire line. Maximum distance per segment or between the devices or between the repeaters respectively is 1200 m.
- Multimaster communication for event-controlled data transfer in large network structures with Ethernet-TCP/IP.
- Costs saved on the commissioning and maintenance of equipment and machines when S-Bus is used via telecommunications networks (analogue, ISDN, GSM).

Features of the SAIA®S-Bus protocol

- **Proven performance** in countless applications for data exchange between PCD controllers.
- **Ease of handling** during installation, commissioning and programming thanks to simple IL instructions, convenient FUPA FBoxes, extensive diagnostic capabilities and the powerful PG5 programming tool.
- **High reliability of transmission** due to CRC-16 error recognition.
- **Simple, efficient and with a high level throughput** due to low protocol overheads and binary protocol type.
- **Unlimited addressing**: Up to 254 stations can be addressed in a local S-Bus network. Via Ethernet-TCP/IP multiples of 254 stations can be addressed.
- **OPC server for SAIA®S-Bus** so that SAIA®PCD controllers can easily be linked to visual display and management systems.

Termination box PCD7.T160¹)

Repeater PCD7.T100¹)

Termination box PCD7.T160¹)

¹) Bus components for RS485 networks on page 9.8
The SAIA®S-Bus gateway function

Every S-Bus network (RS 485) has one master and several slaves. This master, in addition to its function as a master, can also be a gateway. Three further masters can be connected to its three free serial ports. The gateway master regulates access to the slaves by the other masters. All PCD systems can assume this gateway function.

As higher-ranking master devices, it is possible to use all PCD systems, the operator terminals, or a PC as building control system or programming unit.

This gateway configuration brings special advantages if a PC is connected as an additional master running the PG5 programming tool. The programming tool enables transparent access through the gateway station to any slave station during commissioning or while the S-Bus is running. Such access is also possibly remotely, via a modem.

**Advantages of S-Bus gateway**

- Allows network functions and interface adjustments to be realized.
- Supports the connection of 3 additional external master devices. At the same time, one also has access from the user program in the gateway station to all slave stations on the subordinate S-Bus network.
- In addition to the PCD master station, the PG5 programming tool and/or a management system also have access to slave stations on the subordinate S-Bus network. This access can also be via modem and telecommunications networks.
- Universal, direct access by master stations to all slave stations in the RS 485 S-Bus network. Master stations on the Ethernet-all have direct access to slave stations in the subordinate S-Bus network.

You will get further information from the Technical Information 26/370.
Room automation for highest comfort with SAIA®S-Bus

Device-configuration example room automation

<table>
<thead>
<tr>
<th>Type of device</th>
<th>Functions</th>
<th>Kind of configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD station</td>
<td>– Superposed net communication</td>
<td>– Master station or gateway</td>
<td>Universally programmable control station depending on the control function [look at page 1.7]</td>
</tr>
<tr>
<td></td>
<td>– Control tasks</td>
<td>– Communication S-Bus (data mode)</td>
<td></td>
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<tr>
<td></td>
<td>– Ventilator control</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>– Registration of temperature, window contact and presence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Output to heating valve, ventilator (3 stages)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L201 (SAFE)</td>
<td>Output switching module for light and blind control</td>
<td>– Communication S-Bus (data and parity mode)</td>
<td>4 relay output modules for lighting and blinds; on/off current up to 80 A</td>
</tr>
<tr>
<td>PCD7.L101 (SAFE)</td>
<td>Input module for light and blind control switches</td>
<td>– Communication S-Bus (data and parity mode)</td>
<td>Input module with 4 digital inputs; example: 2 inputs for light (A/B), 2 inputs for blinds (up/down)</td>
</tr>
</tbody>
</table>
Device and function overview for room automation

<table>
<thead>
<tr>
<th>Room control</th>
<th>Room controller for heating or cooling (PWM output)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L720</td>
<td>Room controller for heating or cooling (PWM output)</td>
</tr>
<tr>
<td>PCD7.L730</td>
<td>Room controller for heating or cooling (PWM output) in a stainless steel housing</td>
</tr>
<tr>
<td>PCD7.L721</td>
<td>Room controller for heating or cooling with operator lead</td>
</tr>
<tr>
<td>PCD7.L722</td>
<td>Room controller for heating or cooling with operator lead</td>
</tr>
<tr>
<td>PCD7.L723</td>
<td>Room controller for heating, cooling and automatic ventilator control (with 3 stages) with operator lead</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remote I/O RAIL</th>
<th>Digital input module</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L200</td>
<td>Output module, 6 A, contact load with current at make/break up to 12 A</td>
</tr>
<tr>
<td>PCD7.L300</td>
<td>Analogue inputs Pt 1000 or 0…10VDC</td>
</tr>
<tr>
<td>PCD7.L310</td>
<td>Analogue inputs Ni 1000 or 0…10VDC</td>
</tr>
<tr>
<td>PCD7.L400</td>
<td>Analogue inputs 0…10VDC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remote I/O SAFE</th>
<th>Digital input module, IP 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L201</td>
<td>Output module, 10 A, contact load with current at make/break up to 80 A, IP 65</td>
</tr>
<tr>
<td>PCD7.L301</td>
<td>Analogue inputs Pt 1000 or 0…10VDC, IP 65</td>
</tr>
<tr>
<td>PCD7.L311</td>
<td>Analogue inputs Ni 1000 or 0…10VDC, IP 65</td>
</tr>
<tr>
<td>PCD7.L401</td>
<td>Analogue inputs 0…10VDC, IP 65</td>
</tr>
</tbody>
</table>

- = [room controller] direct integrated / [remote I/O] usable for ...
    - = [room controller] choice optional / [remote I/O] usable for ...

**Comprehensively combinable**

Individual room control with SAIA®S-Bus has the following features:

- Connection to the sectors lighting and blind control
- Greatest comfort with minimum energy use
- Flexibility with the use of buildings and selection of devices
- High efficiency at low cost
- All components can be easily installed making a flexible and individual use possible.
- The controls are user-friendly allowing a clear and ergonomical operation
- Comprehensive operation instructions and installation guide
Single room controller DDC-PLUS ROOM

**Individual comfort with single room control**

DDC-PLUS ROOM single room controllers allow the user to adapt the climate of a room to individual needs. Depending on the version, operation of these control devices includes internal and/or external temperature detection, a setpoint adjuster and an occupancy button with LED display.

All devices from the DDC-PLUS ROOM product family can either be stand-alone controllers or they can be connected directly to the master DDC station as SAIA®S-Bus slaves. Different software solutions also allow different possibilities for control and operation in S-Bus mode. The parameters of these controllers can therefore be set and monitored from a central location, or the entire control can take place externally in the master station. In this case the single room controller is only used as a hardware input/output for climate adjustment.

When the DDC master station is inactive, or if the bus connection is broken, the room unit will independently adjust to the specified room temperature setpoint. Within an S-Bus network up to 128 single room controllers can be addressed.

**Different modes of use or operation**

The function of single room control is based on different modes of use or operation. This involves assigning different setpoints to every selectable mode of operation.

**In use**

The room is in use and requires regulation to the comfort temperature. This state can be attained via the occupancy button or in response to an external occupancy detector. The comfort temperature default is 21°C. Users of the room also have the opportunity for individual adjustment of room temperature by means of a setpoint adjuster (default value ±5 K).

**Standby**

The room is ready for use, but no occupancy has yet been registered in the room. As long as the room is considered unoccupied for the purposes of the occupancy function, the room controller will maintain room temperature at the prescribed standby temperature. The default value of the standby offset is 3°C (above or below the comfort setpoint temperature, depending on control type).

**Reduced**

No heating or cooling energy is channelled to the room. This state is required if a window is opened. Control by the occupancy function is not possible in this state. The room controller keeps the room temperature within a certain temperature range. The default value of the reduced offset is 5°C (above or below the comfort setpoint temperature, depending on control type).
# Technical data and ordering details

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>PCD7.L720: Room controller for heating or cooling, without manual control, or as S-Bus slave</td>
<td>Room controller for heating or cooling, with manual control, or as S-Bus slave</td>
<td>Room controller for heating and cooling, with manual control, or as S-Bus slave</td>
<td>Room controller for heating and cooling, with manual control, suitable for fan-coil applications, or as S-Bus slave</td>
</tr>
<tr>
<td>PCD7.L730: identical to ..L720 but with stainless steel housing (protected)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature detection</td>
<td>Detectable temperature range 0…50 °C</td>
<td>1 NTC internal sensor, 1 external connection optionally for Ni 1000 temperature sensor or dew-point detector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control behaviour</td>
<td>P and/or PI behaviour can be set</td>
<td>P and/or PI behaviour can be set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>1 input for potential-free contact, configurable as occupancy or window contact</td>
<td>1 input for potential-free window contact, 1 input for potential free occupancy detector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs</td>
<td>1 triac pulse-width modulated output (500 mA) for electrothermic actuating drives, adjustable as heating or cooling output, quasi-steady control behaviour through clocking, up to 2 electrothermic valves can be connected</td>
<td>2 analogue outputs for motor-driven actuators, drive 0…10VDC, max. load per output 5 mA, up to 5 motor-driven actuators can be connected in parallel</td>
<td>—</td>
<td>3 output stages for fan connection max. 450 W</td>
</tr>
<tr>
<td>Controls</td>
<td>None</td>
<td>Occupancy button with optical display [LED], setpoint adjustment approx. ±5 K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>Bus connection to higher ranking SAIA®DDC, RS 485 interface, data mode, interface transmission speed 2400…19 200 Baud, up to 128 network stations addressable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>24 VAC ±10%</td>
<td>24 VAC ±10%</td>
<td>24 VAC ±10%</td>
<td>24 VAC ±10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.5 W plus actuating drives</td>
<td>0.5 W plus actuating drives</td>
<td>0.5 W plus actuating drives</td>
<td>0.5 W plus actuating drives</td>
</tr>
<tr>
<td>Housing</td>
<td>Plastic, white RAL 9010 or, for ..L730, stainless steel, surface mounting, protection type IP 20 Frame 74.5 x 74.5 x 20 mm [W x H x D]</td>
<td>Frame 127 x 74.5 x 27 mm [W x H x D]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Ordering details

**Single room controller DDC-PLUS-ROOM**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L720</td>
<td>Heating or cooling, without manual control</td>
</tr>
<tr>
<td>PCD7.L730</td>
<td>as ..L720, with stainless steel housing</td>
</tr>
<tr>
<td>PCD7.L721</td>
<td>Heating or cooling, with manual control</td>
</tr>
<tr>
<td>PCD7.L722</td>
<td>Heating and cooling with manual control</td>
</tr>
<tr>
<td>PCD7.L723</td>
<td>as ..L722, plus 3 output stages for fan connection</td>
</tr>
</tbody>
</table>

**26/739 E** SAIA®S-Bus manual
Remote input/output modules for SAIA® S-Bus

Features of remote input/output modules

- **RAIL**: Switch cabinet model for mounting on 35mm DIN rail
- **SAFE**: Protected model for surface mounting with protection class IP 65
- With manual control level and feedback via the bus
- Typ PCD7.1201 (SAFE) for light and blind control
- Status displayed via LED
- Connection via simple RS 485 two-wire line
- S-Bus connection with parity or data mode

You will get further information from the Technical Information 26/339.

The application of slaves in the SAIA® S-Bus

RIO = Remote input/output modules, extraneous devices as e.g. electronic energy counting devices or PCD stations can be used as slaves. When doing this the electric load of the S-Bus must be looked after. The decentral input/output modules RAIL and SAFE have a high impedance and load the S-Bus only slightly. Therefore up to 100 of these slaves can be used in one segment (without Repeater).

Total PCD systems (inc. master PCD) and RIOs on one S-Bus branch

<table>
<thead>
<tr>
<th>Total PCD</th>
<th>Total RIO</th>
<th>Total PCD</th>
<th>Total RIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>0…7</td>
<td>100</td>
<td>14</td>
<td>72</td>
</tr>
<tr>
<td>8</td>
<td>96</td>
<td>15</td>
<td>68</td>
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<td>9</td>
<td>92</td>
<td>16</td>
<td>64</td>
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<td>52</td>
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<tr>
<td>13</td>
<td>76</td>
<td>20</td>
<td>48</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total PCD</th>
<th>Total RIO</th>
<th>Total PCD</th>
<th>Total RIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>44</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>22</td>
<td>40</td>
<td>29</td>
<td>12</td>
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<td>23</td>
<td>36</td>
<td>30</td>
<td>8</td>
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<td>24</td>
<td>32</td>
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<td>4</td>
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<td>25</td>
<td>28</td>
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<td>0</td>
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<tr>
<td>26</td>
<td>24</td>
<td></td>
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<tr>
<td>27</td>
<td>20</td>
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<td></td>
</tr>
</tbody>
</table>

DDC-PLUS RAIL – the switchboard solution

DDC-PLUS RAIL is extremely extendable. With bridge plugs the connections of Bus and power supply between the modules are made especially easy and quickly. By the compact construction minor units can be composed to an optimum system. Thus these devices save much time and space while being more useful and efficient. These small field bus modules are very well suited for being built into switchboards and sub-distributors.

DDC-PLUS SAFE – the decentral solution

DDC-PLUS SAFE really is what the name promises for the rugged reliable module can do much more than others. Safely built into a nicely shaped shock- and water-resistant housing (water-jet protection IP 65) the device provides extremely precise data services. The installation is made above casting, under-floor, in between-ceilings, in cable or balustrade canals or on the sensor. In spite of all compactness DDC-PLUS SAFE can be installed quickly and comfortably: The 40mm flat octagonal housing has got a simple above-casting-assembly. By bayonet closings the lid can be opened and closed at once by 90°-turnings.
Technical data and ordering details

<table>
<thead>
<tr>
<th>Digital inputs</th>
<th>Digital outputs</th>
<th>Analogue inputs</th>
<th>Analogue outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L100</td>
<td>■</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L200</td>
<td>■</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L300</td>
<td>■</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L310</td>
<td>■</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L400</td>
<td>■</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remote I/O SBUS-RAIL
Protection class housing IP 50/terminals IP 20, dimensions 35 × 68 × 60 mm [W × H × D]

- PCD7.L100: 4 electrically isolated inputs 24 VDC, polarity reversal protected, power consumption 1.2 W
- PCD7.L200: 4 relay outputs, “make” contacts, constant current 250 VAC/6 A, current at make/break max. 12 A, supply voltage 24 VDC, polarity reversal protected, power consumption 2.4 W
- PCD7.L300: 4 analogue inputs Pt 1000 and 4 inputs 0...10 VDC, temperature range −50...+150 °C, accuracy ±0.1 °C, supply voltage 24 VDC, polarity reversal protected, power consumption 1 W
- PCD7.L310: 4 analogue inputs Ni 1000 and 4 inputs 0...10 VDC, temperature range −50...+150 °C, accuracy ±0.1 °C, supply voltage 24 VDC, polarity reversal protected, power consumption 1 W
- PCD7.L400: 4 analogue outputs 0...10 VDC, output current 5 mA at 10 VDC, ≥ 2 kΩ, resolution 10 mV/digit, supply voltage 24 VDC, polarity reversal protected, power consumption 1.2 W

Remote I/O SBUS-SAFE
Protection class IP 65, dimensions 159 × 41.5 × 220 mm [W × H × D]

- PCD7.L101: 4 electrically isolated inputs 24 VDC, polarity reversal protected, power consumption 1.2 W
- PCD7.L201: 4 relay outputs, changeover contacts, constant current 250 VAC/10 A, current at make/break max. 80 A, type for light and blind control, supply voltage 24 VDC, polarity reversal protected, power consumption 3.6 W
- PCD7.L301: 4 analogue inputs Pt 1000 and 4 inputs 0...10 VDC, temperature range −50...+150 °C, accuracy ±0.1 °C, supply voltage 24 VDC, polarity reversal protected, power consumption 1 W
- PCD7.L311: 4 analogue inputs Ni 1000 and 4 inputs 0...10 VDC, temperature range −50...+150 °C, accuracy ±0.1 °C, supply voltage 24 VDC, polarity reversal protected, power consumption 1 W
- PCD7.L401: 4 analogue outputs 0...10 VDC, output current 5 mA at 10 VDC, ≥ 2 kΩ, resolution 10 mV/digit, supply voltage 24 VDC, polarity reversal protected, power consumption 1.2 W

For application examples look at page 5.5

**Ordering details**

- **SBUS-RAIL** (mounting on DIN rail)
  - PCD7.L100: Input module with 4 digital inputs, 24 VDC
  - PCD7.L200: Output module with 4 relays 250 VAC/6 A
  - PCD7.L300: Analogue module with 4 inputs each Pt 1000 and 0...10 VDC
  - PCD7.L310: Analogue module with 4 inputs each Ni 1000 and 0...10 VDC
  - PCD7.L400: Analogue module with 4 outputs 0...10 VDC

- **SBUS-SAFE** (surface mount)
  - PCD7.L101: Input module with 4 digital inputs, 24 VDC
  - PCD7.L201: Output module with 4 relays 250 VAC/10 A
  - PCD7.L301: Analogue module with 4 inputs each Pt 1000 and 0...10 VDC
  - PCD7.L311: Analogue module with 4 inputs each Ni 1000 and 0...10 VDC
  - PCD7.L401: Analogue module with 4 outputs 0...10 VDC

26/739 E  SAIA®-S-Bus manual
SAIA®DDC-PLUS systems as nodes in a LONWORKS® NETWORK

**LON – The bus for the building technology**

The LONWORKS® technology is a universal automation concept getting more and more important in building and industry automation. The numerous advantages like decentral intelligence, modular construction and the possibilities of adaptation to existing infrastructures make the LONWORKS® technology more and more interesting for the data transfer in the field sector. The individual net-participants, the so-called nodes, can exchange data among each other event-controlled. LONWORKS® constitutes the platform for a producer-independent communication in the sector-overlapping building automation.

The DDC-PLUS systems fulfill most varied demands by their modular construction and great flexibility. The LON host-node SAIA®DDC-PLUS is based on a modular constructed, freely programmable control system.

**The advantages of LONWORKS®**

**For the architect**
- Technical demands for the building technology can be realized simpler, more flexible and at more favourable cost.
- Bus-appropriate control and indication units can be delivered in all shapes, colours and versions known up to now.

**For builders and operators**
- An installation with a good price/efficiency-relation
- High flexibility and cost saving in case of changes and later installations
- Reduction of operating cost by intelligent energy management
- Building overview by centralized indication, controlling and supervision
- Uniform and clear control of the operation means
- Reduction of maintenance cost

**For planners and installers**
- Avoidability of installation and planning mistakes by a simple and clear installation.
- Less installation work compared to various proprietary solutions.
- Easier observation of regulations by reduction of fire risk.
- Reduction of building cost by multiple use of sensors
- Reduction of cost of education and introduction into work

**Typical applications with LONWORKS®**
- Heating, air handling and ventilation control
- Lighting control
- Controls of sun blinds
- Safety
- Energy management etc.

**The Transceiver Technology FTT 10a**

For the network connection as LON host-node the SAIA®DDC-PLUS systems use the most saleable Transceiver Technology FTT 10a, patented by ECHELON®, with the following features:

<table>
<thead>
<tr>
<th>Kind of cable</th>
<th>2 × 2 twisted pair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission rate</td>
<td>78 kbit/s</td>
</tr>
<tr>
<td>Net structure/cable length</td>
<td>free topology/max. 500 m</td>
</tr>
<tr>
<td></td>
<td>bus topology/max. 2700 m</td>
</tr>
<tr>
<td>Number of LON nodes</td>
<td>max. 64 per segment</td>
</tr>
<tr>
<td></td>
<td>more than 32 000 in one domain</td>
</tr>
</tbody>
</table>

**Standard network variables SNVT**

By the implementation of MIP (Microprocessor Interface Program) in a DDC sub-station more than 1000 SNVT’s (standard network variable types) can be defined and linked up with other PCD or external systems. All SNVT’s at present specified in the LONMARK® are supported by the PCD systems. For the connection to LON nodes with proprietary information also “Explicit Messages” can be transmitted.

**Ordering details**

- **PCD7.F800** Connection module LONWORKS®
- **PCD7.F802** Connection module LONWORKS® with additional serial interface RS 485, electrically connected
- **PCD7.D165** Small terminal and LONWORKS® connection + serial interface RS 485, electrically connected (details on page 7.11)
- **26/767 E** LONWORKS® manual

Overview on pages 4.7 and 4.8
Software integration in LonWorks®

Configuration procedure

Configuring of a PCD host node can be very comprehensive depending on the size of the project. This task for the user is made very much easier by the application of the SAIA®Lon configurator within the programming tool PG5.

For the SNVT’s defined in the configurator the programmer for his application program has various function boxes. With the function boxes the user has the possibility to transmit information depending on deviations, events or time. Linking up the variables is made by standard binding tools that can be bought on the market.

Graphic configuration tool (Plug-In) for clear comfortable adjustment and parametering of rated values and operation data usable with LNS based integration tools.

Programing tool PG5 with graphic function boxes

S-Net configurator integrated in the PG5 for selecting and defining of the Standard Network Variables (SNVT)

Freely programmable host knot which can be equipped and configurated individually (e.g., as gateway between two different networks)

Lon network integration of the individual devices by a tool based on a LNS data base (imaged LonMaker for Windows)
### Configuration of devices example room automation

<table>
<thead>
<tr>
<th>Type of device</th>
<th>Functions</th>
<th>Kind of configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD station</td>
<td>equivalent Lon network participant – control tasks</td>
<td>own neuron network identification – host nodes – more than 1000 SNVT programmable</td>
<td>universally programmable control station depending on the control function (details starting from page 1.7)</td>
</tr>
<tr>
<td>PCD7.L750 (controller)</td>
<td>control of fan-coil, cooling cover and temperature, ventilator control – registration of temperature, window contact, dew point and presence</td>
<td>own neuron network identification – comfortable control via software tool (plug-in)</td>
<td>independent single room controller 6.5 (details on page)</td>
</tr>
<tr>
<td>PCD7.L760 (control unit)</td>
<td>output to heating valve, cooling valve, electric heater, ventilator (3 stages) or 0…10VDC</td>
<td>to be configured via control unit – various possibilities for information connection via Lon</td>
<td>LonMark® certified according to standard “Fan-Coil” 8020 – room control unit connectable</td>
</tr>
<tr>
<td>PCD7.L281 (SAFE)</td>
<td>output switch module for light and blind control</td>
<td>input neuron network identification – input and output network variables type SNVT switch</td>
<td>4 relay output modules for lighting and blinds, current at make/break up to 80 A</td>
</tr>
<tr>
<td>PCD7.L181 (SAFE)</td>
<td>input module for light and blind control switches</td>
<td>own neuron network identification – output network variables type SNVT switch</td>
<td>input module with 4 digital inputs, example: 2 inputs for light [A/B], 2 inputs for blinds (up/down)</td>
</tr>
</tbody>
</table>

---

**Room automation for highest comfort on LonWorks®**

[Image of room automation diagram]
Overview of devices and functions for room automation

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Individual control of temperature, air quality or humidity depending on the room temperature</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Room control unit to the controller PCD7.L750</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Room control unit to the controller PCD7.L750 without ventilator control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Room control unit to the controller PCD7.L750 without ventilator and presence control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Digital input module</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Output module, 6 A, contact load with current at make/break up to 12 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Analogue inputs Pt 1000 or 0…10VDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Analogue inputs Ni 1000 or 0…10VDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Analogue outputs 0…10VDC</td>
</tr>
</tbody>
</table>

<table>
<thead>
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</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Digital input module, IP 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Output module, 10 A, contact load with current at make/break up to 80 A, IP 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Analogue inputs Pt 1000 oder 0…10VDC, IP 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Analogue inputs Ni 1000 oder 0…10VDC, IP 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Analogue outputs 0…10VDC, IP 65</td>
</tr>
</tbody>
</table>

■ = Functions integrated into the device.
❑ = Remote I/O usable for …

Comprehensively combinable

Individual room control for LonWorks® technology has the following features:

- Corresponds to LonMark standard 8020 (fan-coil)
- Control of temperature, air quality and humidity depending on the room temperature
- Greatest comfort with minimum energy use
- Flexibility in control and application of the individual devices
- High efficiency at low cost
- All components are easy to install making a flexible and individual application possible
- The controls are user-friendly allowing a clear and ergonomical operation
- Comprehensive documentation and software functions
The communicating single room controller that complies with the LonMark® standard

- Constructed as a PI controller with one output each for heating and cooling.
- A choice of room information can be picked up either by the room control unit or via LonWorks® such as temperature, presence, window contact, dew-point monitor or setpoint correction.
- Signals for the heating/cooling actuating drives can be output either directly or as a variable via the LonWorks® network.
- Integral transformer for each single heating or cooling actuating drive.
- Fan control via 3-stage relay, or 0...10VDC.
- Electrical heater up to 10 A.
- Distance of room control unit from single room controller up to 50 m.
- The controller is equipped with 24 predefined application mode (stored on a flash EPROM). This reduces engineering to the definition of just a few parameters.
- Room control according to the LonMark® standard “Fan Coil Unit Object (8020)".
- The LonWorks® data interface is integrated within the controller unit and allows both cross-communication with other LonWorks® components and communication with the overriding building management system.

The room control unit for individual comfort

- In connection with the single room controller, room temperature is measured and adjustment of the setpoint by stages is possible.
- Setpoint correction takes place via the two buttons +/- . Parameters can be set for its effective range.
- The presence button can be used to select operating mode (presence or standby).
- Another button enables a 3-stage fan to be triggered.
- All settings, including frost protection, windows and dew-point, are displayed on the multifunctional LCD display.

---

Single room controller PCD7.L750

Room control unit PCD7.L760
Room control unit PCD7.L761 (excl. fan control)
Room control unit PCD7.L762 (excl. fan control and presence button)

Graphical configuration tool [plug-in] for changing operating modes and basic settings (included in the delivery)
Technical data and ordering details

Single room controller PCD7.L750

Supply voltage: 230 VAC, ±10%, 50/60 Hz
Power consumption: 12 VA
Network variable: according to LonMark®, Fan Coil Unit Controller Object #8020
Configuration: with plug-in based on LonMaker® for Windows
Inputs:
– digital 1: window contact
– digital 2: e.g. for presence detector or dew-point monitor
– temperature sensor: instead of room control unit
– room control unit (5 wire)
Outputs Triac¹):
2 × pulse pauses, period 4 min, for heating/cooling
(24 VAC, max. 1 A)
Outputs Relay:
5 × switching contact (250 VAC, 2 A), fan
1 × switching contact (250 VAC, 10 A), electric heater
Outputs 0...10 V (optional):
to external fan control via power separator
Terminals:
screw terminals, connection cross-section 2.5 mm²
Mounting: can be snapped onto 35 mm DIN rail
Dimensions: 157 × 90 × 54 mm (W × H × D)
Protection class: IP 20
Ambient temperature: 0...+45 °C
Ambient humidity: <85 % rH

¹) The device’s integral transformer supplies 6 VA to operate a thermal drive for a heating or cooling valve. If additional, external energy (24 VAC) is connected, 4 thermal drives can be triggered (4×heating, 4×cooling, but not simultaneously).

You will get further information from the Technical Information 26/341.

Room control unit PCD7.L760 for single room controller

Sensor temperature:
measurement range: 10...+55 °C, resolution: 0.1 K
Adjustment range for setpoint correction:
±2.5 K (basic setting)

Key button for operating mode:
presence, standby (stepper switch)

Key button for 3-stage fan control:
0-auto-1-2-3 (stepper switch)

Connection: 5-wire
Mounting: surface mounting
Front dimensions: 76 × 76 mm
Housing: colour pure white, RAL 9010
Protection class: IP 50
Ambient temperature: 0...+45 °C
Ambient humidity: <85 % rH

Ordering details

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L750</td>
<td>Single room controller</td>
</tr>
<tr>
<td>PCD7.L752</td>
<td>Terminal cover</td>
</tr>
<tr>
<td>PCD7.L760</td>
<td>Room control unit</td>
</tr>
<tr>
<td>PCD7.L761</td>
<td>Room control unit (excl. fan control)</td>
</tr>
<tr>
<td>PCD7.L762</td>
<td>Room control unit (excl. fan control and presence button)</td>
</tr>
<tr>
<td>PCD7.L775</td>
<td>Dew-point sensor</td>
</tr>
<tr>
<td>PCD7.L771</td>
<td>Cable temperature sensor</td>
</tr>
<tr>
<td>26/767E</td>
<td>LonWorks® manual</td>
</tr>
</tbody>
</table>

You will get further information from the Technical Information 26/341.
Remote input/output modules for LonWorks®

**Features of remote input/output modules**

- **RAIL**: Switch cabinet model for mounting on 35mm DIN rail
- **SAFE**: Protected model for surface mounting with protection class IP65
- With manual control level and feedback via the bus
- Typ PCD7.1281 (SAFE) for light and blind control
- Status displayed via LED
- Use of the LonWorks® network’s free bus topology
- Driven via FTT 10a transceiver technology
- Standard network variables according to the LonMark® definition

You will get further information from the Technical Information 26/337.

**DDC-PLUS RAIL – the switchboard solution**

DDC-PLUS RAIL is extremely extendable. With bridge plugs the connections of Bus and power supply between the modules are made especially easy and quickly. By the compact construction minor units can be composed to an optimum system. Thus these devices save much time and space while being more useful and efficient. These small field bus modules are very well suited for being built into switchboards and sub-distributors.

**DDC-PLUS SAFE – the decentral solution**

DDC-PLUS SAFE really is what the name promises for the rugged reliable module can do much more than others. Safely built into a nicely shaped shock- and water-resistant housing (water-jet protection IP65) the device provides extremely precise data services. The installation is made above casting, under-floor, in between-ceilings, in cable or balustrade canals or on the sensor. In spite of all compactness DDC-PLUS SAFE can be installed quickly and comfortably: The 40mm flat octagonal housing has got a simple above-casting-assembly. By bayonet closings the lid can be opened and closed at once by 90°-turnings.
### Technical data and ordering details

<table>
<thead>
<tr>
<th>Digital inputs</th>
<th>Digital outputs</th>
<th>Analogue inputs</th>
<th>Analogue outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote I/O SBUS-RAIL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L180</td>
<td>4 electrically isolated inputs 24VDC, polarity reversal protected, power consumption 1.2W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L280</td>
<td>4 relay outputs, &quot;make&quot; contacts, constant current 250VAC/6A, current at make max.12A, supply voltage 24VDC, polarity reversal protected, power consumption 2.4W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L380</td>
<td>4 analogue inputs Pt1000 and 4 inputs 0...10VDC, temperature range −50...+150 °C, accuracy ±0.1°C, supply voltage 24VDC, polarity reversal protected, power consumption 1W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L385</td>
<td>4 analogue inputs Ni1000 and 4 inputs 0...10VDC, temperature range −50...+150 °C, accuracy ±0.1°C, supply voltage 24VDC, polarity reversal protected, power consumption 1W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD7.L480</td>
<td>4 analogue outputs 0...10VDC, output current 5 mA at 10VDC, ≥2 kΩ, resolution 10 mV/digit, supply voltage 24VDC, polarity reversal protected, power consumption 1.2W</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Remote I/O SBUS-SAFE | | | |
| PCD7.L181 | 4 electrically isolated inputs 24VDC, polarity reversal protected, power consumption 1.2W |
| PCD7.L281 | 4 relay outputs, changeover contacts, constant current 250VAC/10A, current at make/break max.80A, type for light and blind control, supply voltage 24VDC, polarity reversal protected, power consumption 3.6W |
| PCD7.L381 | 4 analogue inputs Pt1000 and 4 inputs 0...10VDC, temperature range −50...+150 °C, accuracy ±0.1°C, supply voltage 24VDC, polarity reversal protected, power consumption 1W |
| PCD7.L386 | 4 analogue inputs Ni1000 and 4 inputs 0...10VDC, temperature range −50...+150 °C, accuracy ±0.1°C, supply voltage 24VDC, polarity reversal protected, power consumption 1W |
| PCD7.L481 | 4 analogue outputs 0...10VDC, output current 5 mA at 10VDC, ≥2 kΩ, resolution 10 mV/digit, supply voltage 24VDC, polarity reversal protected, power consumption 1.2W |

For application examples look at page 6.3

### Ordering details

**LON-RAIL** (mounting on DIN rail)
- **PCD7.L180**: Input module with 4 digital inputs, 24VDC
- **PCD7.L280**: Output module with 4 relays 250VAC/6A
- **PCD7.L380**: Analogue module with 4 inputs each Pt1000 and 0...10VDC
- **PCD7.L385**: Analogue module with 4 inputs each Ni1000 and 0...10VDC
- **PCD7.L480**: Analogue module with 4 outputs 0...10VDC

**LON-SAFE** (surface mount)
- **PCD7.L181**: Input module with 4 digital inputs, 24VDC
- **PCD7.L281**: Output module with 4 relays 250VAC/10A
- **PCD7.L381**: Analogue module with 4 inputs each Pt1000 and 0...10VDC
- **PCD7.L386**: Analogue module with 4 inputs each Ni1000 and 0...10VDC
- **PCD7.L481**: Analogue module with 4 outputs 0...10VDC
PROFIBUS FMS with BA profile for building automation or PROFIBUS DP for decentral peripherals

Why PROFIBUS in building automation?

PROFIBUS is the bus internationally standardised according to EN 50 170 for industry and building automation. PROFIBUS opens the whole world of standardised network communication for the most varied applications among different products.

- PROFIBUS is completely open, producer-independent and stable.
- More than 3 million different PROFIBUS devices, such as PC, controls, control terminals, drives, valves, decentral data points etc. from more than 600 providers are in use today worldwide. That results in a high degree of safety and investment protection for the user.
- PNO, the PROFIBUS user organisation with which Saia-Burgess Controls is represented within Europe, maintains a qualified certifying system and examines the PROFIBUS products as far as maintenance of standards and interoperability are concerned.

For the various application sectors there are two specifically appropriate nets that can be chosen from:

- PROFIBUS FMS the multimaster network for data traffic on cell level in industry automation and with the BA profile for building automation.
- PROFIBUS DP the network protocol, up to 12 Mbit/s fast, for the field level in production automation is more and more used also in building automation because of its large range of accessories.

PROFIBUS with SAIA®PCD

For the assembly of decentral controls the user finds all control components in the broad SAIA®PCD range not only for PROFIBUS FMS but also for DP. The PROFIBUS connections to the DDC sub-stations are modular and therefore can be used specifically where they are needed. Decentral data points called PCD0 as well as intelligent control terminals supplement the broad PROFIBUS range of SAIA® automation systems.

Base units or processor modules and sockets for plug-on communications modules
**PROFIBUS network participants**

**PROFIBUS FMS**
- PCD6
- PCD4
- PCD2
- PCD2.M250
- PCD1

**PROFIBUS DP**
- PCD0
- PCD2
- PCD1
- OPERATOR TERMINAL

**Network configurators for PROFIBUS**

For all network versions the user has at his disposal in the programming tool PG5 comfortable network configuration tools. With these the user defines his variables, objects and network parameters.

**Ordering details**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.F700</td>
<td>PROFIBUS FMS connection module</td>
</tr>
<tr>
<td>PCD7.F750</td>
<td>PROFIBUS DP connection module as master</td>
</tr>
<tr>
<td>PCD7.F770</td>
<td>PROFIBUS DP connection module as slave</td>
</tr>
<tr>
<td>PCD7.F772</td>
<td>PROFIBUS DP connection module as slave + electrically isolated RS-485 serial port</td>
</tr>
<tr>
<td>PCD7.D164</td>
<td>Small terminal and PROFIBUS DP connection (as slave) + electrically connected RS-485 serial port (details on page 7.11)</td>
</tr>
<tr>
<td>26/742 E</td>
<td>PROFIBUS manual</td>
</tr>
<tr>
<td>26/742 E</td>
<td>Manual for FMS configurator</td>
</tr>
<tr>
<td>26/765 E</td>
<td>Manual for DP configurator</td>
</tr>
</tbody>
</table>

**Network analyser for PROFIBUS**

We recommend using the network analyser type PROFIMON produced by the company SOFTING GmbH, Richard-Reizner-Allee 6, D-85540 Haar
MP-Bus interface for BELIMO® damper actuators

Interface features

- Integration of up to 16 damper actuators and sensors (connection module PCD2.T500)
- Comfortable handling when starting operation and servicing
- Direct service device connection for the parametering device MFT-H
- Integration and exchange of drives in an uncomplicated manner
- Compatible with the BELIMO® damper actuators with MFT/MFT2 technology
- Interface for various devices and demands
- 3-wire-cabling (power supply and bus)
- No special cables or terminating resistances necessary
- Cost saving by the reduced efforts in cabling and projecting
- Comprehensive software library
- You will get further information from the Technical Information 26/342

Sensor connection

On each addressed MFT-/MFT2 drive an additional sensor can be integrated in the MP Bus cable. The following sensors for temperature, humidity, pressure, etc. are supported by the different MFT-/MFT2 drives:

- **MFT Drives**
  - active sensors
  - 2-point on/off signals

- **MFT2 drives**
  - active sensors
  - passive sensors
  - 2-point on/off signals

This simple solution saves the application of expensive bus-appropriate sensors and reduces the cost of the cabling considerably.

OEM applications

With compact forms of application in particular, the MP-Bus can lead to cost savings. Up to 16 actuators and sensors can be run on one bus segment through the MP-Bus. All accesses to MP-Bus information by higher ranking bus systems, such as LonWorks® or Ethernet TCP/IP, are thereby ensured.

Field applications

Due to the minimal cabling requirements, field actuators can be triggered in areas as individual damper actuators, valves, VAV regulation, fire prevention technology. From planning to commissioning, the efficient MP-Bus network is extremely simple to use.
**PCD2.T500 connection module**

- Connection module for PCD1/PCD2 automation systems
- Can be plugged onto an I/O module socket
- 2 RS 232 or TTL communications channels
- 2 actuator connection channels, each for 8 MFT/MFT2 actuators and sensors
- Connection of very wide variety of sensors: passive and active sensors, 2-point sensor on the actuator
- Integrated monitoring of actuator function
- Extremely easy service check

The PCD2.T500 module serves as an interface between the automation system (DDC-PLUS) and the MFT/MFT2 damper actuators from BELIMO Automation AG. The module has up to two branches (bus connections) each having eight connected actuators. Each branch can be run asynchronously, independently of each other.

**Software interface**

The position data and feedback indications are transposed within the programming tool PG5 by predefined function boxes. Various information are ready on the output of the function boxes:
- Position data
- Sensor value (resistance or °C)
- Various status indications

**Possible number of actuators and interfaces**

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>RS232 interfaces available</th>
<th>MP-Bus branches</th>
<th>Actuators</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS1</td>
<td>–</td>
<td>–</td>
<td>–/1</td>
<td>–/8</td>
</tr>
<tr>
<td>PCD1</td>
<td>M110</td>
<td>1</td>
<td>2/1</td>
<td>16/8</td>
</tr>
<tr>
<td></td>
<td>M120/M130</td>
<td>2</td>
<td>4/1</td>
<td>32/8</td>
</tr>
<tr>
<td>PCD2</td>
<td>M110</td>
<td>3</td>
<td>6/1</td>
<td>48/8</td>
</tr>
<tr>
<td></td>
<td>M120/M150</td>
<td>3</td>
<td>6/1</td>
<td>48/8</td>
</tr>
<tr>
<td></td>
<td>M250</td>
<td>5</td>
<td>10/1</td>
<td>80/8</td>
</tr>
<tr>
<td>PCD4</td>
<td>M110</td>
<td>–</td>
<td>–</td>
<td>–/8</td>
</tr>
<tr>
<td></td>
<td>M125 [²]</td>
<td>1</td>
<td>–/1</td>
<td>–/8</td>
</tr>
<tr>
<td></td>
<td>M145/M445 [²]</td>
<td>3</td>
<td>–/3</td>
<td>–/24</td>
</tr>
<tr>
<td></td>
<td>M170 [²]</td>
<td>–</td>
<td>–/3</td>
<td>–/24</td>
</tr>
<tr>
<td>PCD6</td>
<td>M300</td>
<td>4</td>
<td>–/4</td>
<td>–/32</td>
</tr>
</tbody>
</table>

¹ max. number with PCD2.T500 / max. number with PCD7.F180
² together with the PCD4.C340 combined CPU bus module

**PCD7.F180 connection module**

Utilization is possible on the following automation systems:
- PCS1 compact controller
- System PCD1 at space A (without PCD1.M110)
- System PCD2 at space A (without PCD2.M110)
- System PCD6 at space A0/A1/A2/A3 of .M300 processor module

This module has the possibility of connecting an MP-Bus branch with 8 actuators and sensors.

In contrast to the PCD2.T500, this module does not offer any operator, diagnostic or service capabilities on board. The module was designed for use with the compact controller. Due to the smaller number of connectable actuators and the lack of additional functions, Saia recommends use mainly with the PCS1 compact controller.

The functional connection to the software library is across the “single master box”. This carries out interface configuration and initialization.

**Ordering details**

PCD2.T500  MP-Bus connection module to plug into PCD1/2 I/O module socket

PCD7.F180  MP-Bus connection module to plug into interface socket A

For MP-Bus compatible sensors, contact your local agent.
Overcoming limits with SAIA® DDC-PLUS and EIB (European Installation Bus)

As an EIB user you will once reach the limits of efficiency of the EIB components actually on the market. For an efficient administration of building installations sector-overlapping efficient functions are necessary. The freely programmable sub-stations SAIA® DDC-PLUS with the connected EIB-driver offer an optimum solution for complicated EIB tasks.

This comfortable and versatile system offers:

- The universal functionality of a DDC sub-station in the EIB network.
- A completely graphic programming allowing to realise more complicated tasks without much basic knowledge.
- A large series of digital and analogue data point modules allowing the connection of all kinds of sensors and actuators.
- One or more serial interfaces through which can be universally communicated with other devices.
- The DDC sub-stations allow a clear exchange of EIB data according to LonWorks®, BACnet, M-Bus, Ethernet-TCP/IP, SAIA® S-Bus, PROFIBUS, MP-Bus BELIMO® or Modbus. Thus a PCD system opens the up to now complicated network transfers in a simple manner.

The function principle

The DDC sub-station has access to the EIB network through the serial interface RS232 of the EIB interface module. The PCD control according to its user program gives orders through the EIB network receiving from there continually the information from the EIB peripherals. Logical link-ups, time and counting functions, mathematical operations or sequential processes can be realised in free programming.

Bestellangaben

PCD9.C59 EIB M5  EIB library for PG5
26/750 E  Manual for EIB library
Distant reading of energy counting devices via M-Bus protocol
Further connections of external systems

**M-Bus protocol**

The M-Bus (EN 1434-3) is an international standard for the distant reading of energy counting devices. The M-Bus connection is made through a RS232 standard interface and an M-Bus converter. Therewith water, heat or electrical energy quantities in a DDC sub-station can be registered. Further evaluation of the measurement data is done through a library with function boxes in the SAIA®FUPLA.

At present the following heat quantity counting devices are supported:

- Zenner (heat quantity counting device¹)
- Aquametro (CALEC-MB and AMBUS-IS¹)
- ABB (heat quantity counting device SVM RV FZ¹)

These drivers are delivered from www.engiby.ch. You will find further M-Bus connections also under www.ludwig-systemelektronik.de

**Further external system connections**

Besides the enumerated communication possibilities there are further special drivers for the PCD systems:

- Modbus RTU and ASCII (for systems such as e.g. ABB, Honeywell or Staefa)
- Siemens 3964R
- Cerberus (burglary and fire alarm)
- GENbus (Grundfos pumps)
- STX-BUS (heating counting devices NeoVac)
- TwiLine (communication drivers for installation and load bus from the company Wahli AG / CH)
- JCI-N2Bus driver to be delivered from Johnson Controls spa, Italy / Milan
- York (compact air handling units)
- Fidelio (hotel management)
- Cerberus (alarm systems)

You will find updated driver information on the Internet pages of the following systems-houses of Saia-Burgess Controls:

www.engiby.ch
www.ludwig-systemelektronik.de
www.uhlemann.de
The communication processor LS2-F660 is a multifunctional plug-in card for the DDC-PLUS systems PCD1/PCD2 realising transpositions between various protocols and the PCD systems. The card discharges the PCD system from communication tasks representing a considerable system extension by using resources of its own. The initialisation of the two interfaces is done by clear function boxes.

The serial interfaces

The card has got two interfaces which can be operated simultaneously and with different protocols. The interface Port 0 is on the basis card and can be applied optional as RS232 with the control lines TxD, RxD, CTS, RTS, DSR, DTR and DCD or as RS 422/RS 485 in half- or full-duplex operation. The signals RxD and TxD are indicated by 2 LEDs. Port 1 has been installed on a plug-in extension module. It can be applied optional as RS232, as RS 422/RS 485 in half- or full-duplex operation. The signals RxD and TxD are indicated by 2 other LEDs.

If a port is configurated as SAIA®S-Bus-Slave the module can recognize the Parity- or Data-Mode automatically.

The serial standard protocols

The following protocols are available:
- SAIA®S-Bus Master and Slave Mode,
  Optional: Data registration (DBs)
- Modbus Master and Slave Mode
- GENIbus pump bus from Grundfos
- 5964R including Interpreter RK512
- M-Bus Complete M-Bus Protocol,
  One adapted FuplaBox per counting device

For the protocols the corresponding component-families are available for the PCD1/PCD2 and the series xx7. The communication processor LS2-F660 transposes the commands according to the protocol implemented. Word-commands that can be executed as 16-Bit-commands in the 3964R- and Modbus-Protocol are executed automatically as 32-Bit-command if the SAIA®S-Bus is applied.

Indications for orders

- LS2-F660/Pxxx Basis communication card
- LS2-E661/Pxxx Extension card
- LS2-E662/Pxxx Extension card, electrically separated

Distribution and support

Ludwig Systemelektronik
Am Neumaerkt 30
D-22041 Hamburg
Telephone +49 40 656 81510
Telex +49 40 656 81514
Email: info@ludwig-system.de
Homepage: www.ludwig-system.de

Ludwig-Systemelektronik has been a system house of Saia-Burgess Controls since 1994.
Configuration example: Installation with different bus connections

**Controller PCD2.M120 with EIB-Bus, MP-Bus from BELIMO® as well as remote data points and/or single-room controller through SAIA®S-Bus**

**Configuration of devices**

<table>
<thead>
<tr>
<th>Device</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD2.M120</td>
<td>Base unit with 8 I/O module sockets (details on page 2.6)</td>
</tr>
<tr>
<td>PCD7.T500</td>
<td>MP-Bus connection module to be plugged on I/O module socket (details on page 6.12)</td>
</tr>
<tr>
<td>PCD2.E../A../W..</td>
<td>Input/output modules ¹) (details starting from page 2.10)</td>
</tr>
<tr>
<td>PCD7.F520</td>
<td>Communications module with RS 232 (details on page 4.8)</td>
</tr>
<tr>
<td>PCD7.L..</td>
<td>Single-room controller DDC-PLUS ROOM (details on page 5.7), remote input/output modules DDC-PLUS SBUS-RAIL/SBUS-SAFE (details on page 5.9)</td>
</tr>
<tr>
<td>PCD9.C59 EIB M5</td>
<td>EIB library for PG5 look on page 6.13</td>
</tr>
</tbody>
</table>

¹) The MP-Bus connection module occupies one I/O module socket thus being left still 7 I/O module sockets in the base unit for further data points.
Configuration example:
Network installation with field bus systems

**Communication of various stations through SAIA®-S-Bus and field bus systems**

The building management system is connected with all participants of the SAIA®-S-Bus-network through a main station as gateway-master. The communication with the field bus level remains with the respective sub-station. If data from the field bus are to be transmitted to the lead station they must be kept ready in the sub-station.

**Configuration of devices**

**Gateway-Master / Sub-station A**
- **PCD2.M170** Base unit with 8 I/O module sockets (details on page 2.7)
- **PCD2.F520** Communications module with RS 232 and RS 485/RS 422 (details on page 4.8)
- **PCD7.F700** Connection module PROFIBUS FMS (details on page 4.8)
- Input/output modules (details starting from page 2.10)

**Sub-station B**
- **PCS1.C823.A000** Compact controller DDC-COMPACT with graphic display, manual/emergency control and communications module PCD7.F110 (details on page 1.8)

**Sub-station C**
- **PCD2.M170** Base unit with 8 I/O module sockets (details on page 2.7)
- **PCD2.F520** 2 communications modules with RS 232 and RS 485/RS 422 (details on page 4.8)
- **PCD2.E../A../W../** Input/output modules (details starting from page 2.10)
- **PCD7.D250** Control terminal with display of 8 × 40 or 4 × 20 characters (details starting from page 7.12)
- **PCD7.K422** Interface connecting cable (details on page 7.12)
- **PCD7.L..** Single-room controller DDC-PLUS ROOM (details on page 5.7)
- **PCD9.C59 EIB MS** EIB library for PG5 look on page 6.13
Configuration example: Network installation with Ethernet

Communication of various stations through Ethernet and standardised field bus systems

Via Ethernet-TCP/IP (UDP) all participants have access to the data of all other participants. Various management system or programming devices can also be connected. Through Ethernet also the gateway functionality can be used and thereby an access can be created to the controller of the subordinate SAIA®S-Bus-Network.

Configuration of devices

<table>
<thead>
<tr>
<th>Station</th>
<th>PCD2.M150</th>
<th>Base unit with 8 I/O module sockets [details on page 2.6]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PCD7.F650</td>
<td>Ethernet-TCP/IP connection module [details on page 5.4]</td>
</tr>
<tr>
<td></td>
<td>PCD7.F110</td>
<td>Communications module with RS 485/RS 422 [details on page 4.8]</td>
</tr>
<tr>
<td></td>
<td>PCD2.E../A../W..</td>
<td>Input/output modules [details starting from page 2.10]</td>
</tr>
<tr>
<td>Station</td>
<td>PCD2.M150</td>
<td>Base unit with 8 I/O module sockets [details on page 2.6]</td>
</tr>
<tr>
<td></td>
<td>PCD7.F650</td>
<td>Ethernet-TCP/IP connection module [details on page 5.4]</td>
</tr>
<tr>
<td></td>
<td>PCD2.E../A../W..</td>
<td>Input/output modules [details starting from page 2.10]</td>
</tr>
<tr>
<td>Station</td>
<td>PCD2.M170</td>
<td>Base unit with 8 I/O module sockets [details on page 2.7]</td>
</tr>
<tr>
<td></td>
<td>PCD7.F650</td>
<td>Ethernet-TCP/IP connection module [details on page 5.4]</td>
</tr>
<tr>
<td></td>
<td>PCD7.F800</td>
<td>LonWorks® connection module [details on page 4.8]</td>
</tr>
<tr>
<td></td>
<td>PCD2.E../A../W..</td>
<td>Input/output modules [details starting from page 2.10]</td>
</tr>
<tr>
<td>Station</td>
<td>PCD2.M150</td>
<td>Base unit with 8 I/O module sockets [details on page 2.6]</td>
</tr>
<tr>
<td></td>
<td>PCD7.F650</td>
<td>Ethernet-TCP/IP connection module [details on page 5.4]</td>
</tr>
<tr>
<td></td>
<td>PCD7.F120</td>
<td>Communications module with RS 232 [details on page 4.8]</td>
</tr>
<tr>
<td></td>
<td>PCD2.E../A../W..</td>
<td>Input/output modules [details starting from page 2.10]</td>
</tr>
</tbody>
</table>

- M-Bus protocol look on page 6.14
- Programming tool PG5 look on page 8.1
- Building Management System VISI-PLUS look on page 7.3
SAIA®DDG-PLUS as the interface between human and building
For users of a building, comfort and satisfaction are achieved through reliable regulation of room climate and the control of light and shade.

To optimize the technical installations of a building or identify any faults, the SAIA®DDC-PLUS product range offers a variety of possibilities for visual display. The user can select the components that are best suited to his needs from a wide range of operator terminals and building management systems.
SAIA® ViSi-PLUS – The modular building management system

This software package makes the monitoring, visual display and operation of your building installations quite easy! This is because it matches both the needs of the building user and of the facility operator. Its software modules are simple to use and make it easy for the developer to map it perfectly to the building requirements, at the same time providing the user with a complete view.

Main characteristics
- Distributed client/server processing
- Object-oriented, graphical user interface
- Scalable, modular architecture
- System with multitasking capabilities
- WINDOWS® NT/2000/XP operating system
- Efficient database access
- Interface to other Windows applications
- OPC client compatible

Distributed intelligence
Because of their distributed client/server architecture, SAIA® ViSi-PLUS modules can be integrated wherever they offer the user optimum benefit. To enable rapid reaction and local intervention in case of problems, SAIA® ViSi-PLUS offers well developed capabilities for remote diagnosis and remote operation.
Short description of the functions

Visual display and graphical editor
All relevant parts of the facility can be suitably represented for the user with the powerful graphical editor. The use of vector and bitmap graphics allows both overviews and detailed information to be displayed. The graphical editor also provides the visual display in runtime mode, this means that it is possible to switch to edit mode at any time to make adjustments or modifications (password protected).

Time-switch program
Whether you would like, at specific times, to switch primary facilities, lighting elements or other aggregates, the time-switch program permits it in a simple, straightforward way. Switch intervals are adjusted via an entry mask or by directly dragging the blue time bar with the mouse. In addition, all signal changes that have been executed can be checked by the time-switch manager.

Trend projection
With this module you can, for example, receive every month a summary energy balance sheet for all consumers in a building. Regardless of whether you have to monitor the consumption of water, electricity or heat, this trend evaluation provides you with the necessary overview to enable suitable measures to be initiated.
Short description of the functions

Logging

This module logs and stores all events. The log viewer, with its integral filter functions, allows all important occurrences to be represented as required in a way that suits the user.

Alarm management

Alarm management is an essential constituent of any building management system. With SAIA®ViSi-PLUS it is possible, by observing threshold values, to display all relevant points of information for the user in a plain-text alarm window. Two separate alarm lists ensure a better overview. The first one gives an overview of all alarms; the second enables all current alarms to be examined.

Remote alarms via Pager/SMS

When monitoring technical building installations it is necessary to guarantee that, in the absence of service personnel, fault messages are forwarded quickly and safely. On the other hand, direct diagnosis of the fault message is possible via remote dialling, thus avoiding unnecessary journeys by service personnel.
Ordering details

Program packages

Three different SAIA®ViSi-PLUS packages are available to the system integrator. Depending on the problem definition and complexity of technical building installations, a package can be used that suits the operator.

**PCD8.S98 V01 E9**
Data management system and graphical editor
250 information points (SAIA®S-Bus driver)
Time-switch program
Engineering tool (without code generator)

**PCD8.S98 V02 E9**: as ..V01.. package
with SAIA®S-driver (250 information points, 5 channels)
+ 1000 information points (SAIA®S-Bus driver)
+ Trend recording and alarm management
+ Database system

**PCD8.S98 V03 E9**: as ..V02.. package
+ 10 000 information points (SAIA®S-Bus driver)
+ Logging
+ Remote alarms via Pager/SMS
+ Engineering tool inc. code generator
+ Program for ASCII export
+ Programming interface to VB, VC++, Delphi

**PCD8.S98 V06 E9**: as ..V03.. package
with SAIA®S-driver (10 000 information points, 5 channels)

**PCD8.S98 V10 E9**: as ..V06.. package but with 50 channels

**PCD8.S98 V11 E9**: as ..V06.. package but with 100 channels

**PCD8.S98 V12 E9**: as ..V06.. package but without limitation of channels

**Individual program modules**

**PCD8.S98 V29 M5** Data management system
**PCD8.S98 V20 M5** Data base system
**PCD8.S98 V22 M5** Engineering tool
**PCD8.S98 V31 M5** Engineering tool inc. code generator
**PCD8.S98 V23 M5** Alarm management
**PCD8.S98 V24 M5** Logging
**PCD8.S98 V25 M5** Trend projection and evaluation
**PCD8.S98 V26 M5** ASCII export for trend data
**PCD8.S98 V27 M5** Remote alarms via Pager/SMS/E-mail
**PCD8.S98 V28 M5** Programming interface to VB, VC++, Delphi

**PCD8.S98 V32 M5** Time scheduler
**PCD8.S98 V33 M5** Data logger
**PCD8.S98 V34 M5** Alarm report program

**PCD8.S98 V30 M5** Graphics editor for one station
**PCD8.S98 V21 M5** for second station
**PCD8.S98 V50 M5** for 2...5 stations
**PCD8.S98 V51 M5** for 2...10 stations
**PCD8.S98 V52 M5** without limitations

**SAIA®S-Bus driver**

**PCD8.S98 V40 M5** for 250 information points
**PCD8.S98 V41 M5** for 1000 information points
**PCD8.S98 V42 M5** for 10 000 information points

**SAIA®S-driver**

**PCD8.S98 V60 M5** for 250 information points, 5 channels
**PCD8.S98 V61 M5** for 1000 information points, 5 channels
**PCD8.S98 V62 M5** for 10 000 information points, 5 channels
**PCD8.S98 V63 M5** for 10 000 information points, 50 channels
**PCD8.S98 V64 M5** for 10 000 information points, 1000 channels
**PCD8.S98 V65 M5** for 10 000 information points, without limitation of channels

**PROFIBUS DP driver**

**PCD8.S98 V43 M5** for 250 information points
**PCD8.S98 V44 M5** for 1000 information points
**PCD8.S98 V45 M5** for 10 000 information points

**OPC client**

**PCD8.S98 V46 M5** for 250 information points
**PCD8.S98 V47 M5** for 1000 information points
**PCD8.S98 V48 M5** for 10 000 information points
The efficient way of integrating SAIA® DDC controllers into any visual display and building management system

**OPC server ...**

- **Standardized OPC port:** Expertise in vendor-specific protocols is no longer required. This results in significantly lower costs for development, commissioning and maintenance.

- **OPC project:** All the OPC data of networked controllers is united in a single project. This produces a clear data structure and simplifies the proper definition of data points.

- **Import of PLC variables:** Symbols and data points previously defined for the PLC program with the PG3/PG4 or PG5 programming tools can be carried over and used unmodified by the OPC server.

- **Communication through all routes:** Communication between the OPC server and the SAIA® DDC can take place via RS232, RS485, modem, TCP/IP or dual-port RAM (PC/104). Several OPC clients can access the OPC server simultaneously across several PC ports.

**... in combination with the SAIA® S-Bus**

- **OPC server/SAIA® PCD:** Visual display and building management systems with OPC client interfaces can be connected to any SAIA® DDC controller. This enables every OPC client, via the OPC server, to read data from the PCD or write data to the PCD.

- **S-Bus protocol:** This is built into every SAIA® DDC. The simple, safe and efficient protocol supports point-to-point and master-slave communication between the OPC server and the controller. The OPC server supports all S-Bus protocols, including the new protocol via UDP/IP.

- **Master-slave network:** Up to 5 external OPC servers can simultaneously access all SAIA® DDC controllers present in the network and their data.

- **PG5 programming tool:** Efficient programming and diagnosis of all SAIA® DDC controllers present in the network via the SAIA® S-Bus.

The use of an OPC server with ViSi-PLUS as OPC client makes sense if external systems of other producers are connected through further OPC servers. The OPC platform thus allows the use of client and server systems of different producers.

OPC server

OPC client

OPC client

Ethernet-TCP/IP

OPC client

OPC server

S-Bus TCP/IP

S-Bus

S-Bus

S-Bus

S-Bus

S-Bus

OPC server

PCD1...PCD6 as gateway master

Construction/network with SAIA® S-Bus
Technical data and ordering details

**Technical data**

- **OPC data access standards supported**
  1.01a, 2.04

- **PC operating systems supported**
  MS Windows NT 4.0 SP4
  MS Windows 95
  MS Windows 98
  Windows 2000
  Windows XP

- **Protocols supported**
  S-Bus data, parity and break mode
  S-Bus via UDP/IP
  PGU mode
  PC104

- **Controller types supported**
  all PCD/PCS controller types

- **Possible connection types between OPC server (PC) and PLC**
  RS232
  RS485
  Modem
  Dual-port RAM (PCD2.M250)
  Ethernet 10/100 Base-T (PCD7.F65..)

- **PLC data that can be displayed in OPC server**
  inputs, outputs, flags, registers, data blocks, timers, counters, date-time, display register, firmware version

- **Data formats for import functions**
  *.src (PG3, PG4),
  *.pcd (PG4, PG5),
  *.sy5 (PG5)
  *.csv (comma separated values; e.g. from Excel)

**Ordering details**

- **OPC server for the SAIA®S-Bus**
  PCD8.C59001M9 Complete version, for one PC and one application
  PCD8.C59001M93 Complete version, for 3 PC of the same application
  PCD8.C59001M95 Complete version, for 5 PC of the same application
  PCD8.C59001M9A Complete version, for 10 PC of the same application
  PCD8.C59001M9S Complete version, for an unlimited number of PC of the same application
  PCD8.C59001M9U Complete version, unlimited number of licences for OEM
  PCD8.C59001E1 Demo version, limited to one hour run time
Remote display 6-character with high clarity LEDs

Economical solution for the remote display of process data

- Particularly bright, 6-digit LED display with decimal point: Very easy to read, even under poor conditions of visibility (up to 4 metres away and at a viewing angle of 150°).
- Uses none of the PCD's valuable serial ports: Only requires 3 transistor outputs on the following standard modules: PCD2.A400 (inc. version Z06), PCD2.A460/..A465 or PCD2.B100 or the corresponding modules from the PCD4 and PCD6 series.
- Standard-size housing: 24 × 48 mm, front panel protection class IP 65.
- Set of 77 units on self-adhesive labels: e.g. I, P, gal, U, f, 1/min, N, kJ, K, kHz, % ...
- You will get further information from the Technical Information 26/361.

Convenient commissioning and programming

- Ease of adjustment to different modules: This is done with FBox in the FUPLA editor or FBs in the IL editor. The refresh rate for the display is defined at the same time.
- Up to 14 remote displays can be driven in parallel: For every display different data sources (with up to 6 digits) can be chosen by an FBox.
- Serial driving of 2 (or more) remote displays: An advantage when more than 6 digits have to be displayed.

Technical data

| Display: | 7-segment LED, 8 mm high with decimal point |
| Supply voltage: | 10...50 VDC (U_i), residual ripple max. 5 % |
| Power consumption: | max. 50 mA |
| Input voltage (data, clock, enable): | low 0...0.2 x U_i high 0.6 x U_i...50 VDC |
| Input resistance: | approx. 10 kΩ |
| EMC/noise immunity: | class B according to EN 55011 or EN 50082-2 |
| EMC/emission: | according to EN 55081-2 |
| Protection class: | front panel IP 65 |
| Ambient temperature: | operation: –10°C to +50°C, storage: –25°C to +70°C |
| Mounting: | flush mounting, fastened with collar or 2 × M4 screws, any mounting position |
| Terminals: | screw terminals for 0.3...1.6 mm² |

Ordering details

PCD7.D120 Remote display with 6-digit LED indicator, delivery includes collar, front frame for screw fastening, seal and a set of units on self-adhesive labels.

4'108'4836'0 Adaptation frame for cut out 24.5 × 48.5 mm
Comfortable installation lead via control terminals

Why choose control terminals without text memory?

- All resources are in the same place: The DDC controller's user memory is utilized for this and is managed with the standard programming tool. As a result, any possibility of resource problems is immediately excluded.
- Access via any network and via modem: Resources and text can therefore be accessed anywhere, any time. This reduces the cost of commissioning and enables modifications to be made comfortably from one's desk.
- Design of display and menu structures with the HMI-Editor: This convenient add-on tool for the PG5 programming package makes it easier to edit text and variables, create screen structures and assign functions to keys.
- Point-to-point connection as stand-alone or in a network: All terminals are connected via an RS232 interface. Up to 31 terminals type PCD7.D790 or ..D795 can be run in a network at a single RS485 interface. The ..D250 terminal can additionally be equipped for RS422 or TTY/20 mA current loop.

Easy creation of visual displays with the HMI-Editor

- Add-on tool for the PG5 programming package. Simple structuring of terminal screens for the whole range of SAIA® text terminals.
- Text, variables and system messages generated and edited with just a few clicks. A menu tree includes all the terminal screens that are to be displayed and their accompanying objects (text, connections to PCD data points, formats, etc.).
- Play function for checking a terminal menu. It verifies the display, sequence of menu screens, submenus, etc.
- Same terminal menu for different terminals.
- Event controlled alarms are displayed instantly. Several lines for detailed messages in plain text. Special lines with time stamp or status information.
- Password hierarchy of up to 10 levels protects each individual object.
- Function keys and LEDs can be programmed individually for each terminal.

You will get further information from the Technical Information 26/355.

With projecting the play function allows a direct indication without a terminal.
The plug-on type small terminals PCD7.D16. for PCD1/PCD2

Saia’s small terminals take advantage of the high intelligence and user memory of SAIA®PCD controllers and can therefore be used economically and to optimal effect with industrial control or building automation systems.

- The terminals plug straight onto the socket B of the PCD1 or PCD2 controllers. This combination results in an intelligent controller with the capacity for direct user interface.

- The texts to be displayed are stored in the PCD control device. This means that the same programming tool can be used as for the control program. In addition, access to text and variables is possible at any time via modem.

- The intelligent text output of PCD controllers allows variables to be edited as desired and output to the display in the necessary format.

- Depending on the choice of terminal set and base unit, further communications possibilities arise. The following table gives details of these.

<table>
<thead>
<tr>
<th>Terminal set</th>
<th>Additional communications channels</th>
<th>Mounting possible on</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.D162</td>
<td><img src="image1.png" alt="Symbol" /> <img src="image2.png" alt="Symbol" /> <img src="image3.png" alt="Symbol" /> <img src="image4.png" alt="Symbol" /> <img src="image5.png" alt="Symbol" /></td>
<td><img src="image6.png" alt="Symbol" /> <img src="image7.png" alt="Symbol" /></td>
</tr>
<tr>
<td>PCD7.D163</td>
<td><img src="image8.png" alt="Symbol" /> <img src="image9.png" alt="Symbol" /> <img src="image10.png" alt="Symbol" /> <img src="image11.png" alt="Symbol" /> <img src="image12.png" alt="Symbol" /></td>
<td><img src="image13.png" alt="Symbol" /> <img src="image14.png" alt="Symbol" /></td>
</tr>
<tr>
<td>PCD7.D164</td>
<td><img src="image15.png" alt="Symbol" /> <img src="image16.png" alt="Symbol" /> <img src="image17.png" alt="Symbol" /> <img src="image18.png" alt="Symbol" /> <img src="image19.png" alt="Symbol" /></td>
<td><img src="image20.png" alt="Symbol" /> <img src="image21.png" alt="Symbol" /></td>
</tr>
<tr>
<td>PCD7.D165</td>
<td><img src="image22.png" alt="Symbol" /> <img src="image23.png" alt="Symbol" /> <img src="image24.png" alt="Symbol" /> <img src="image25.png" alt="Symbol" /> <img src="image26.png" alt="Symbol" /></td>
<td><img src="image27.png" alt="Symbol" /> <img src="image28.png" alt="Symbol" /></td>
</tr>
</tbody>
</table>

1) Cover required with opening no. 4'104'7338'0
2) ei = electrically isolated, ec = electrically connected
3) The additional RS 485 port is not available here

Ordering details

**Small terminal set**, consisting of terminal with display of 4 x 16 characters and interface module
- PCD7.D162 without additional interface
- PCD7.D163 with additional RS 422/RS 485 interface
- PCD7.D164 with additional PROFIBUS DP connection (as slave) + RS 485 interface, electrically isolated
- PCD7.D165 with additional LonWorks® connection + RS 485 interface, electrically connected

Order for ready-to-use, configured combinations, consisting of a controller and terminal set:
- Type of controller + terminal set, e.g. **PCD1.M120.D162** or **PCD2.M150.D165**. Please note possible combinations as set out in the above table.
Use of multiple SAIA® terminals

Up to 6 identical terminals (with PCD2.M170) can be operated in a star structure via an RS232 serial data port. The same information is displayed on all terminals.

Terminal types PCD7.D790 or ..D795 with “Free terminal protocol” can be operated in a point-to-point network. This means that up to 31 terminals of the same type can be connected to a single RS485 port. Basically, the same information is therefore displayed on all connected terminals. However, with the HMI editor it is possible to define a menu window for each terminal that can instantly be displayed at any time via a function key.

Technical data

You will get further information from the Technical Information 26/363.

Ordering details

PCD7.D170  Small terminal for front panel mounting with display of 4 × 16 characters
PCD7.D230  External graphics terminal (available from 01/2003)
PCD7.D202  Terminal for front panel mounting with display of 4 × 20 characters
PCD7.D790⁺  Terminal for front panel mounting with display of 8 × 40 or 4 × 20 characters
PCD7.D795⁺  Terminal for front panel mounting with display of 4 × 20 characters
PCD7.D250  Industrial text terminal for front panel mounting with display of 8 × 40 or 4 × 20 characters
PCD7.F210  Interface module RS 422 for ..D250
PCD7.F231  Interface module 20 mA current loop (TTY) for ..D250

Interface connecting cables (shielded, for RS232)
PCD7.K412  between ..D170, ..D202 or ..D250 terminals and the PGU connector of PCD CPUs (9-pole D-type connector both ends), length 2.5 m
PCD7.K422  between ..D170, ..D202 or ..D250 terminals (9-pole D-type connector) and the RS232 interface of the PCD1, PCD2 or PCD4 (wire ends free), length 2.5 m

26/753E  Manual PCD7.D16../..D170
26/770E  Manual PCD7.D250

⁺ Version with “free terminal protocol” as well as HMI-Editor from V 1.1 are required.
Technical data for the operator terminals

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
<td>LCD with LED back-lighting</td>
<td>4×20 characters 74×24 mm</td>
<td>graphics display</td>
</tr>
<tr>
<td><strong>Display dimensions (w×h)</strong></td>
<td>4×16 characters 60×24 mm</td>
<td>4×20 characters 74×24 mm</td>
<td>128×64 pixels 70×40 mm</td>
</tr>
<tr>
<td><strong>Character size (w×h)</strong></td>
<td>5×7 pixels + cursor 2.95×4.75 mm</td>
<td>5×7 pixels + cursor 2.95×4.75 mm</td>
<td>–</td>
</tr>
<tr>
<td><strong>Contrast adjustment</strong></td>
<td>software</td>
<td>software</td>
<td>software</td>
</tr>
<tr>
<td><strong>Back-lighting</strong></td>
<td>off/on</td>
<td>on/off</td>
<td>on/off</td>
</tr>
<tr>
<td><strong>Character fonts</strong></td>
<td>ASCII + special characters for English, German, French, Scandinavian languages</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

| **Keyboard**      | – | – | 1 |
| **Single-knob control** | – | – | – |
| **Function keys, customizable** | 5 | 4 | – |
| **LEDs for function keys** | – | 4 | – |
| **System keys / numeric keys** | 9 / 12 | 9 / 12 | – |
| **Alphanumeric keys** | – | – | – |
| **Diagnostic LEDs** | – | – | – |

| **Memory**        | – | – | – |
| **Text and data** | Entire text and data memory of PCD controller, i.e. max. 368 KBytes for PCS1, max. 140 KBytes for PCD1, up to max. 1 MByte for PCD2.M17… and PCD6 |

| **Interfaces**    | RS 232 | RS 232 | RS 232 / RS 422 / RS 485 |
| **to SAIA®PCD**   | 9-pole, D-type | 9-pole, D-type | 9-pole, D-type |

| **Performance and programming** | – | – | – |
| **Performance features** | All performance features of PCD controllers are also available for terminals, such as: up to 8000 texts, data in any format, alarm handling, password protection, real time clock |
| **Programming software** | HMI-Editor | HMI-Editor | HMI-Editor |

| **General data**   | – | – | – |
| **Supply voltage U_t** | 24VDC, +30%/-20% or 19VAC, ±15%, full-wave rectified |
| **Power consumption at U_t** | 100 mA | 200 mA | 250 mA |
| **Interference immunity** | CE mark according to EN 50 081-1 and 50 082-2 |
| **Protection class (front)** | IP 65 | IP 65 | IP 54 |
| **Operating temperature** | 0…+50°C | 0…+50°C | 0…+50°C |
| **Storage temperature** | –25…+70°C | –25…+70°C | –25…+70°C |
| **Humidity (without condensation)** | 5…95% | 5…95% | – |

¹) available from 01/2003
²) Software configuration of the 5 keys produces 5 function keys or, with a shift key, 8 key functions.
### Type designation

<table>
<thead>
<tr>
<th>Type designation</th>
<th>PCD7.D250</th>
<th>PCD7.D790 ¹)</th>
<th>PCD7.D795 ¹)</th>
</tr>
</thead>
</table>

### Display

<table>
<thead>
<tr>
<th>Type</th>
<th>LCD mit LED Hintergrundbeleuchtung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display dimensions (w × h)</td>
<td>4 × 20 / 8 × 40 characters ²) 130 × 36 mm</td>
</tr>
<tr>
<td>2 × 20 characters 74 × 12 mm</td>
<td></td>
</tr>
<tr>
<td>4 × 20 characters 70 × 21 mm</td>
<td></td>
</tr>
<tr>
<td>Character size (w × h)</td>
<td>10 × 14 / 5 × 7 pixels + cursor 5.3 × 7.5 / 2.6 × 3.7 mm</td>
</tr>
<tr>
<td>5 × 7 pixels 2.95 × 4.75 mm</td>
<td></td>
</tr>
<tr>
<td>5 × 7 pixels 2.95 × 4.75 mm</td>
<td></td>
</tr>
<tr>
<td>Contrast adjustment</td>
<td>software</td>
</tr>
<tr>
<td>potentiometer</td>
<td></td>
</tr>
<tr>
<td>potentiometer</td>
<td></td>
</tr>
<tr>
<td>Back-lighting</td>
<td>on/off</td>
</tr>
<tr>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Character fonts</td>
<td>ASCII + special characters + IBM CodePage 437</td>
</tr>
<tr>
<td>ASCII (0…127)</td>
<td></td>
</tr>
<tr>
<td>ASCII (0…127)</td>
<td></td>
</tr>
</tbody>
</table>

### Keyboard

<table>
<thead>
<tr>
<th>Type</th>
<th>Function keys, customizable</th>
<th>LEDs for function keys</th>
<th>System keys / numeric keys</th>
<th>Alphanumeric keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 / 12</td>
<td>8</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Memory

<table>
<thead>
<tr>
<th>Type</th>
<th>Text and data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire text and data memory of PCD controller, i.e. max. 368 KBytes for PCS1 max. 160 KBytes for PCD1, up to max. 1 MByte for PCD2.M17.. and PCD6</td>
<td></td>
</tr>
</tbody>
</table>

### Interfaces

<table>
<thead>
<tr>
<th>Type</th>
<th>to SAIA®PCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS 232, with ..F2.. modules RS.422 or TTY</td>
<td></td>
</tr>
<tr>
<td>RS 232 / RS 485 25-pole, D-type</td>
<td></td>
</tr>
<tr>
<td>RS 232 / RS 485 25-pole, D-type</td>
<td></td>
</tr>
</tbody>
</table>

### Performance and programming

<table>
<thead>
<tr>
<th>Type</th>
<th>Performance features</th>
</tr>
</thead>
<tbody>
<tr>
<td>All performance features of PCD controllers are also available for terminals, such as: up to 8000 texts, data in any format, alarm handling, password protection, real time clock</td>
<td></td>
</tr>
</tbody>
</table>

### Programming software

<table>
<thead>
<tr>
<th>Type</th>
<th>HMI-Editor ¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMI-Editor ¹)</td>
<td></td>
</tr>
<tr>
<td>HMI-Editor ¹)</td>
<td></td>
</tr>
</tbody>
</table>

### General data

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage U,&lt;sub&gt;c&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC, +30 %–20 % oder 19 VAC, ±15 %, full-wave rectified</td>
<td></td>
</tr>
<tr>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>Power consumption at U,&lt;sub&gt;c&lt;/sub&gt;</td>
<td>320 mA</td>
</tr>
<tr>
<td>200 mA</td>
<td></td>
</tr>
<tr>
<td>200 mA</td>
<td></td>
</tr>
<tr>
<td>Interference immunity</td>
<td>CE mark according to EN 50081-1 and 50082-2</td>
</tr>
<tr>
<td>Protection class (front)</td>
<td>IP 65</td>
</tr>
<tr>
<td>IP 65</td>
<td></td>
</tr>
<tr>
<td>IP 65</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0…50 °C</td>
</tr>
<tr>
<td>0…50 °C</td>
<td></td>
</tr>
<tr>
<td>0…50 °C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–25…+70 °C</td>
</tr>
<tr>
<td>–20…+60 °C</td>
<td></td>
</tr>
<tr>
<td>–20…+60 °C</td>
<td></td>
</tr>
<tr>
<td>Humidity (without condensation)</td>
<td>DIN 40 040 class F</td>
</tr>
<tr>
<td>5…95 %</td>
<td>≤85 %</td>
</tr>
<tr>
<td>≤85 %</td>
<td></td>
</tr>
</tbody>
</table>

¹) Version with "free terminal protocol" is required.
²) Text size is switchable and text can also be displayed in reverse (see picture).
³) HMI-Editor from V 1.1 is required.
The range of industrial SAIA®terminals has been extended and modernised. The range adds to the existing range of text terminals. Instead of storing their texts in the user memory of the PCD control system, the terminals have their own internal memory and an intelligent CPU. This terminal range is the ideal complement to SAIA®PCD control devices.

- Menu-driven programming under MS-Windows 95/98/2000 or NT, all terminals in the series are compatible
- Large user memory fitted as standard
- 4 different interface versions in all models, plus bus coupling to the economical SAIA®S-Bus, or, as an option, to the open PROFIBUS DP
- Communications drivers for all SAIA®PCDs and other control systems
- Front panel protection to IP 65

**Text terminals**

These are distinguished by clear LCD displays, of 2 × 20 or 4 × 40 characters, back-lit for use in varying lighting conditions. The terminals have many function keys, each with associated LEDs. All function keys can be individually labelled with replaceable strips. For the smallest terminal, PCD7.D70.., there is also an expansion keyboard with an additional 20 function keys.

**Graphics terminals**

A comprehensive range from an LED back-lit LCD display to a ¼-size VGA colour screen. Here too, a large number of function keys are provided, each with 2 LEDs, that can be individually labelled with replaceable strips.

**Control terminals without keys – “Touch Screen”**

Four models are available. The range starts with a small low-cost monochrome display with CCFL backlit, and extends to a full TFT colour display. Each has a resistive matrix touch screen which replaces the function keys. The programmer creates each user-interface page with texts and labelled touch-sensitive keys for the operator – the perfect HMI.

<table>
<thead>
<tr>
<th>Ordering details</th>
<th>Text terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.D700</td>
<td>Terminal with 4 lines × 20 characters</td>
</tr>
<tr>
<td>PCD7.D706</td>
<td>Terminal with 4 lines × 20 characters, with integrated PROFIBUS DP connection</td>
</tr>
<tr>
<td>PCD7.D710</td>
<td>Terminal with 4 lines × 20 characters</td>
</tr>
<tr>
<td>PCD7.D720</td>
<td>Terminal with 4 lines × 40 characters</td>
</tr>
<tr>
<td>PCD7.D725</td>
<td>as ..D720 but with parallel port to printer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphics terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.D730</td>
</tr>
<tr>
<td>PCD7.D735</td>
</tr>
<tr>
<td>PCD7.D740</td>
</tr>
<tr>
<td>PCD7.D745</td>
</tr>
<tr>
<td>PCD7.D750</td>
</tr>
<tr>
<td>PCD7.D755</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Touch-screen terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.D760</td>
</tr>
<tr>
<td>PCD7.D765</td>
</tr>
<tr>
<td>PCD7.D766</td>
</tr>
<tr>
<td>PCD7.D771</td>
</tr>
<tr>
<td>PCD7.D772</td>
</tr>
<tr>
<td>PCD7.D770</td>
</tr>
<tr>
<td>PCD7.D775</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PCS1</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.D709</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

| PCD7.F778             | Plug-in module PROFIBUS DP |
|                       | to PCD7.D10 and PCD7.D20.. |

| PCD7.F779             | External module PROFIBUS DP |
|                       | to graphic and touch-screen terminals |

| 4'507'4815 '0         | Back-up battery lithium 3.6 V |
|                       | for RAM and RTC to PCD7.D10 and PCD7.D20.. |

| 4'507'4817 '0         | Back-up battery lithium 3 V |
|                       | for RAM and RTC to graphic and touch-screen terminals |
## Technical data of text terminals

<table>
<thead>
<tr>
<th>Feature</th>
<th>PCD7.D70..</th>
<th>PCD7.D710</th>
<th>PCD7.D72..</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>LCD (backlit with LED)</td>
<td>LCD (backlit with LED)</td>
<td>LCD (backlit with LED)</td>
</tr>
<tr>
<td><strong>Display format</strong></td>
<td>text</td>
<td>text</td>
<td>text</td>
</tr>
<tr>
<td><strong>Display dimensions (h × l)</strong></td>
<td>4 lines × 20 characters 20.8 × 70.4 mm</td>
<td>4 lines × 20 characters 20.8 × 70.4 mm</td>
<td>4 lines × 40 characters 23.2 × 140.5 mm</td>
</tr>
<tr>
<td><strong>Character dimensions (l × h)</strong></td>
<td>5 × 7 pixels 2.95 × 4.75 mm</td>
<td>5 × 7 pixels 2.95 × 4.75 mm</td>
<td>5 × 7 pixels 2.8 × 4.9 mm</td>
</tr>
<tr>
<td><strong>Keyboard</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function keys, customizable</td>
<td>5)</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Function keys LEDs</td>
<td>5</td>
<td>24</td>
<td>46</td>
</tr>
<tr>
<td>Operative keys / alphanumeric</td>
<td>10/10</td>
<td>14/10</td>
<td>15/10</td>
</tr>
<tr>
<td>Operative LEDs / diagnosis</td>
<td>2/-</td>
<td>3/3</td>
<td>4/3</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Languages on line</td>
<td>6</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>No. of report pages</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Variables per pages</td>
<td>16</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Data format</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISA alarms</td>
<td>–</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Info-messages</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Help-messages / info-messages / alarms</td>
<td>1024/1024/-</td>
<td>1024/1024/1024</td>
<td>1024/1024/1024</td>
</tr>
<tr>
<td>Alarm event list</td>
<td>–</td>
<td>256 messages</td>
<td>256 messages</td>
</tr>
<tr>
<td>Password</td>
<td>10 levels, 8 bit</td>
<td>10 levels, 8 bit</td>
<td>10 levels, 8 bit</td>
</tr>
<tr>
<td>Real-time clock with date</td>
<td>–</td>
<td>yes (back-up battery)²</td>
<td>yes (back-up battery)²</td>
</tr>
<tr>
<td><strong>Memories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects (flash EPROM)</td>
<td>256 KBytes</td>
<td>320 KBytes</td>
<td>256 KBytes</td>
</tr>
<tr>
<td>Recipes (RAM)</td>
<td>–</td>
<td>32 KBytes (back-up battery)²</td>
<td>96 KBytes (back-up battery)²</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to the SAIA®PCD (serial, 25-pole)</td>
<td>RS 232 / RS 422 / RS 485 / current loop 20 mA ITTY</td>
<td></td>
<td>R5232</td>
</tr>
<tr>
<td>to PC or printer (serial, 9-pole)</td>
<td>–</td>
<td>R5232</td>
<td>R5232</td>
</tr>
<tr>
<td>to printer (parallel)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>with Centronics as ..D725</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Networks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAIA®-Bus</td>
<td>as master</td>
<td>as master</td>
<td>as master</td>
</tr>
<tr>
<td>PROFIBUS DP (up to 12 Mbit/s)</td>
<td>as slave ..D706</td>
<td>as slave (via plug-in module)²</td>
<td>as slave (via plug-in module)²</td>
</tr>
<tr>
<td><strong>Programming</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programming software</td>
<td>in five languages for Windows 95 / 98 / 2000 and Windows NT²</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General data</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>24 VDC (18...32 VDC)</td>
<td>24 VDC (18...32 VDC)</td>
<td>24 VDC (18...32 VDC)</td>
</tr>
<tr>
<td>Power consumption (24 VDC)</td>
<td>15 W</td>
<td>9 W</td>
<td>9 W</td>
</tr>
<tr>
<td>Interference immunity</td>
<td>CE mark according to EN 50081-2 and 50082-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection class (front)</td>
<td>IP 65</td>
<td>IP 65</td>
<td>IP 65</td>
</tr>
<tr>
<td>Operation temperature</td>
<td>0...50 °C</td>
<td>0...50 °C</td>
<td>0...50 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>−20...+60 °C</td>
<td>−20...+60 °C</td>
<td>−20...+60 °C</td>
</tr>
<tr>
<td>Air humidity (without condensation)</td>
<td>≤85%</td>
<td>≤85%</td>
<td>≤85%</td>
</tr>
<tr>
<td>Dimensions (W × H × D)</td>
<td>148 × 188 × 45.5 mm</td>
<td>126 × 196 × 65 mm</td>
<td>252 × 196 × 65 mm</td>
</tr>
</tbody>
</table>

¹ Expansion keyboard PCD7.D709 with 20 function keys each with 1 LED 2 to order separately.
<table>
<thead>
<tr>
<th>Type designation</th>
<th>PCD7.D73..</th>
<th>PCD7.D74..</th>
<th>PCD7.D75..</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>LCD monochrome (LED backlit)</td>
<td>LCD monochrome (CCFL backlit)</td>
<td>LCD 16 color standard STN (CCFL backlit)</td>
</tr>
<tr>
<td>Display format</td>
<td>graphic</td>
<td>graphic</td>
<td>graphic</td>
</tr>
<tr>
<td>Resolution</td>
<td>240 × 64 pixels</td>
<td>240 × 128 pixels</td>
<td>320 × 240 pixels (1/4 VGA)</td>
</tr>
<tr>
<td>Display dimensions (h × l)</td>
<td>39 × 132 mm</td>
<td>70 × 124 mm (5.5”)</td>
<td>88.6 × 116.6 mm (5.7”)</td>
</tr>
<tr>
<td>Text character (lines × characters)</td>
<td>8 × 40/4 × 20/2 × 10</td>
<td>16 × 40/8 × 20/4 × 10</td>
<td>16 × 40/8 × 20/4 × 10</td>
</tr>
<tr>
<td>Character dimensions (l × h)</td>
<td>6 × 8/12/16/24 × 32 pixels 3.2 × 4.2/6.5/8.5/12.7/17 mm</td>
<td>6 × 8/12/16/24 × 32 pixels 3.2 × 4.2/6.5/8.5/12.7/17 mm</td>
<td>6 × 8/12/16/24 × 32 pixels 3.2 × 4.2/6.5/8.5/12.7/17 mm</td>
</tr>
<tr>
<td>Keyboard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function keys, customizable</td>
<td>24</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>LEDs function / operative / diagnosis</td>
<td>46/4/3</td>
<td>32/4/3</td>
<td>46/4/3</td>
</tr>
<tr>
<td>Operative keys / alphanumeric</td>
<td>15/10</td>
<td>15/10</td>
<td>14/10</td>
</tr>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Languages on line</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>No. of operative/report pages / variables</td>
<td>1024/32</td>
<td>1024/48</td>
<td>1024/64</td>
</tr>
<tr>
<td>Data format</td>
<td>decimal, hexadecimal, binary, BCD, ASCII, floating point</td>
<td>static/dynamic</td>
<td>static/dynamic</td>
</tr>
<tr>
<td>Dynamic texts</td>
<td>Value depending on dimensions of project</td>
<td>static/dynamic</td>
<td>static/dynamic</td>
</tr>
<tr>
<td>ISA alarms / info-messages</td>
<td>1024/1024</td>
<td>1024/1024</td>
<td>1024/1024</td>
</tr>
<tr>
<td>Alarm event list</td>
<td>256 messages</td>
<td>256 messages</td>
<td>256 messages</td>
</tr>
<tr>
<td>Trends / sampling points</td>
<td>32/40 per trend</td>
<td>32/40 per trend</td>
<td>32/1024 per trend</td>
</tr>
<tr>
<td>Operating mode</td>
<td>real time / trigger / event list</td>
<td>real time / trigger / event list</td>
<td>real time / trigger / event list</td>
</tr>
<tr>
<td>Password</td>
<td>10 levels, 8 bit</td>
<td>10 levels, 8 bit</td>
<td>10 levels, 8 bit</td>
</tr>
<tr>
<td>Real-time clock with date</td>
<td>yes (back-up battery)</td>
<td>yes (back-up battery)</td>
<td>yes (back-up battery)</td>
</tr>
<tr>
<td>Memories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects (flash EPROM)</td>
<td>512 KBytes</td>
<td>512 KBytes</td>
<td>1 MBytes</td>
</tr>
<tr>
<td>Recipes (RAM)</td>
<td>128 KBytes [back-up battery]</td>
<td>128 KBytes [back-up battery]</td>
<td>128 KBytes [back-up battery]</td>
</tr>
<tr>
<td>Interfaces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to the SAIA®PCD, xx7 (serial, 25-pole)</td>
<td>RS 232/RS 422/RS 485/current loop 20 mA (TTY)</td>
<td>RS 232/RS 485</td>
<td>RS 232/RS 485</td>
</tr>
<tr>
<td>to printer [parallel]</td>
<td>with Centronics as ..D735</td>
<td>with Centronics as ..D745</td>
<td>with Centronics as ..D755</td>
</tr>
<tr>
<td>Networks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAIA®S-Bus</td>
<td>as master</td>
<td>as master</td>
<td>as master</td>
</tr>
<tr>
<td>PROFIBUS DP [up to 12 MBit/s]</td>
<td>as slave via external module</td>
<td>as slave via external module</td>
<td>as slave via external module</td>
</tr>
<tr>
<td>Programming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>24 VDC (18...32 VDC)</td>
<td>24 VDC (18...32 VDC)</td>
<td>24 VDC (18...32 VDC)</td>
</tr>
<tr>
<td>Power consumption [24 VDC]</td>
<td>11 W</td>
<td>11 W</td>
<td>15 W</td>
</tr>
<tr>
<td>Interference immunity</td>
<td>CE mark according to EN 50 081-2 and 50 082-2</td>
<td>IP45</td>
<td>IP45</td>
</tr>
<tr>
<td>Protection class [front]</td>
<td>IP45</td>
<td>IP45</td>
<td>IP45</td>
</tr>
<tr>
<td>Operation / storage temperature</td>
<td>0...50°C/–20...+60°C</td>
<td>0...50°C/–20...+60°C</td>
<td>0...50°C/–20...+60°C</td>
</tr>
<tr>
<td>Air humidity [without condensation]</td>
<td>≤85%</td>
<td>≤85%</td>
<td>≤85%</td>
</tr>
<tr>
<td>Dimensions (W × H × D)</td>
<td>252 × 196 × 65 mm</td>
<td>252 × 196 × 65 mm</td>
<td>305 × 196 × 65 mm</td>
</tr>
</tbody>
</table>

1) to order separately
## Technical data of touch-screen terminals

<table>
<thead>
<tr>
<th>Type designation</th>
<th>PCD7.D76..</th>
<th>PCD7.D771/..D772</th>
<th>PCD7.D770/..D775</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aype</td>
<td>LCD monochrome STN (CCFL backlit)</td>
<td>LCD blue in 4 stages STN (CCFL backlit)</td>
<td>LCD 256 color standard STN (CCFL backlit)</td>
</tr>
<tr>
<td>Touch screen</td>
<td>matrix 20 × 8</td>
<td>matrix 20 × 16</td>
<td>matrix 20 × 16</td>
</tr>
<tr>
<td>Resolution</td>
<td>240 × 128 pixels</td>
<td>320 × 240 pixels (% VGA)</td>
<td>320 × 240 pixels (% VGA)</td>
</tr>
<tr>
<td>Display dimensions [h × l]</td>
<td>70 × 124 mm [5.5&quot;]</td>
<td>86.4 × 115.2 mm [5.8&quot;]</td>
<td>88.6 × 116.6 mm [5.7&quot;]</td>
</tr>
<tr>
<td>Text character (lines × characters)</td>
<td>16 × 40 / 8 × 20 / 4 × 10</td>
<td>16 × 40</td>
<td>16 × 40 / 8 × 20 / 4 × 10</td>
</tr>
<tr>
<td>Character dimensions (l × h)</td>
<td>6 × 8/12 / 16 × 24 / 32 pixels</td>
<td>8 × 15/16 × 30/32 × 60 pixels</td>
<td>8 × 15/16 × 30/32 × 60 pixels</td>
</tr>
<tr>
<td>Resolution (CCFL backlit)</td>
<td>3 × 4 / 6 × 8 / 12 × 16 mm</td>
<td>≤ 5.2 / 5.6 / 10.4 / 11.2 × 20.8 mm</td>
<td>≤ 5.2 / 5.6 / 10.4 / 11.2 × 20.8 mm</td>
</tr>
<tr>
<td><strong>Lamp life</strong></td>
<td>10 000 h at 25 °C</td>
<td>15 000 h at 25 °C</td>
<td>15 000 h at 25 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Features</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Languages on line</td>
<td>8</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>No. of operative/report pages</td>
<td>1024</td>
<td>64</td>
<td>1024</td>
</tr>
<tr>
<td>Variables per pages</td>
<td>48</td>
<td>24</td>
<td>64</td>
</tr>
<tr>
<td>Bit map</td>
<td>These can be imported from a standard package during the configuration phase of the project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphic symbols</td>
<td>static/dynamic</td>
<td>static/dynamic</td>
<td>static/dynamic</td>
</tr>
<tr>
<td>Keys per page</td>
<td>160</td>
<td>24</td>
<td>320</td>
</tr>
<tr>
<td>Dynamic texts</td>
<td>Value depending on dimensions of project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISA alarms/info-messages</td>
<td>1024/1024</td>
<td>–/256</td>
<td>1024/1024</td>
</tr>
<tr>
<td>Help-messages (pages/info-messages/alarm)</td>
<td>1024/1024</td>
<td>64/256</td>
<td>1024/1024</td>
</tr>
<tr>
<td>Alarm event list</td>
<td>256 messages</td>
<td>–</td>
<td>256 messages</td>
</tr>
<tr>
<td>Trends [bytes/registers/sample points]</td>
<td>max. 512/128/240 per trend</td>
<td>–</td>
<td>max. 2048/512/240 per trend</td>
</tr>
<tr>
<td>Operating mode</td>
<td>real time/trigger/event list</td>
<td>real time/trigger/event list</td>
<td>real time/trigger/event list</td>
</tr>
<tr>
<td>Password</td>
<td>10 levels, 8 bit</td>
<td>10 levels, 8 bit</td>
<td>10 levels, 8 bit</td>
</tr>
<tr>
<td>Real-time clock with date</td>
<td>yes (back-up battery)</td>
<td>Software clock</td>
<td>yes (back-up battery)</td>
</tr>
<tr>
<td><strong>Memories</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects (flash EPROM)</td>
<td>512 KBytes</td>
<td>512 KBytes</td>
<td>1 MBytes</td>
</tr>
<tr>
<td>Recipes (RAM)</td>
<td>128 KBytes (back-up battery)</td>
<td>16 KBytes (flash EPROM)</td>
<td>128 KBytes (back-up battery)</td>
</tr>
<tr>
<td>Recipes/number of variables per recipe</td>
<td>1024/256</td>
<td>128/256</td>
<td>2048/512</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interfaces</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>to the SAIA®PCD, (serial, 25-pole)</td>
<td>RS 232 / RS 422 / RS 485 / current loop 20 mA (TTY)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to PC or printer (serial, 15-pole)</td>
<td>–</td>
<td>–</td>
<td>RS 232/RS 485</td>
</tr>
<tr>
<td>to printer (parallel)</td>
<td>with Centronics as ..D765</td>
<td>–</td>
<td>with Centronics as ..D775</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Networks</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SAIA®S-Bus</td>
<td>as master</td>
<td>as master</td>
<td>as master</td>
</tr>
<tr>
<td>PROFIBUS DP (up to 12 Mbit/s)</td>
<td>as slave</td>
<td>as slave with ..D772</td>
<td>as slave via external module</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Programming</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming software</td>
<td>in five languages for 95/98/2000 and Windows NT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>General data</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24 VDC (18...32 VDC)</td>
<td>24 VDC (18...32 VDC)</td>
<td>24 VDC (18...32 VDC)</td>
</tr>
<tr>
<td>Power consumption [24 VDC]</td>
<td>15 W</td>
<td>10 W</td>
<td>15 W</td>
</tr>
<tr>
<td>Interference immunity</td>
<td>CE mark according to EN 50 081-2 and 50 082-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection class (front)</td>
<td>IP 65</td>
<td>IP 65</td>
<td>IP 65</td>
</tr>
<tr>
<td>Operation temperature</td>
<td>0...+50 °C</td>
<td>0...+50 °C</td>
<td>0...+50 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–20...+60 °C</td>
<td>–20...+60 °C</td>
<td>–20...+60 °C</td>
</tr>
<tr>
<td>Air humidity (without condensation)</td>
<td>≤ 85%</td>
<td>≤ 85%</td>
<td>≤ 85%</td>
</tr>
<tr>
<td>Dimensions [W × H × D]</td>
<td>210 × 158 × 60 mm</td>
<td>210 × 158 × 60 mm</td>
<td>210 × 158 × 60 mm</td>
</tr>
</tbody>
</table>

1) to order separately    2) as ..D766 or via external module
Data logging – easy and complete

dbLog is a complete software solution, proven for the recording of system history data in every SAIA®PCD controller - combined with integral tools for archiving and analysing data on a Windows® PC.

Tailor-made FUPLA function boxes for the PG5 programming tool enable the data block data memory of PCD systems to be used for recording history data.

The powerful dbLog tools for Windows® 95/98 and NT/2000/XP allow data to be read, archived and analysed – all without extra tools or costly visual display.

The procedure is extremely simple:
1. Data recording “on site” in the PCD/PCS
2. Direct read-out via SAIA®S-Bus, modem/ISDN …
3. Long-term archiving on PC background store
4. Display as trend or table on the PC
5. Delivery to visual display, database, etc.

dbLog function boxes

- Data logging with FUPLA – through simple, fast FBox positioning and parameter setting.
- dbLog FBoxes can be used with PG5 (from version 1.0) and PG4 (from version 1.4)
- Data recording can be time controlled, program controlled or change dependent.
- Up to 12 log inputs per FBox reduce programming expense to a minimum.
- Optimized utilization of data block capacity through compressed recording format.
- No loss of program memory for use of data blocks from DB 4000.
- Central monitoring of filling level can, for example, be used to call the modem FBox “Call Master”.

dbLog Windows® tools

- The dbLog Manager is used for the central management of all settings and simple calling of all tools.
- Automatic adoption of all dbLog parameters from the PG5 project.
- Integral viewer for trend diagrams and tabular data display.
- Delivery of all dbLog data with the SAIA®S-Bus protocol via Modem, ISDN, GSM, TCP/IP and PC/104.
- Integral time pattern control for the regular, automatic reading of all dbLog data.
- Automatic receipt and answering of incoming calls (auto-answer mode).

Further information

A detailed presentation of dbLog can be found on Internet under www.dbLog.de.

From this site it is also possible to download complete product documentation and demo versions of dbLog programs, together with other useful software tools for SAIA®PCDs.

About Uhlemann Techware®

Uhlemann Techware® has been a Saia-Burgess Controls system house since 1995.

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Telefax: ++49 6105 204 929
E-mail: info@uhlemann.de
Homepage: www.uhlemann.de
Configuration example:
Complex network installations

Connecting different SAIA®S-Bus Head stations to a building management system

The Head stations collect all data out of the subordinated S-Bus networks and make them available for the building management system. The respective Head station is responsible for the data transfer in the subordinated network. A direct transverse data traffic between the head stations, has to be established over the building management system.

Configuration of devices

Head station A
- **Base unit** with 8 I/O module sockets [details on page 2.6]
- **PCD2.F520** Communication module with RS 232 and RS 485/RS 422 [details on page 4.8]
- **PCD7.F110** Communication module with RS 485/RS 422 [details on page 4.8]
- **PCD2.E../A../W..** Input/output modules [details starting from page 2.10]
- **PCD7.D250** Industrial text terminal with display of 8 × 40 or 4 × 20 characters [details starting from page 7.12]

Head station B
- **Base unit** with 8 I/O module sockets [details on page 2.6]
- **PCD2.F520** Communication module with RS 232 and RS 485/RS 422 [details on page 4.8]
- **PCD7.F110** Communication module with RS 485/RS 422 [details on page 4.8]
- **PCD2.E../A../W..** Input/output modules [details starting from page 2.10]
- **PCD7.D250** Industrial text terminal with display of 8 × 40 or 4 × 20 characters [details starting from page 7.12]
- **PCD7.L..** Single room controller and room control unit DDC-PLUS ECO [details on page 6.6], remote input/output modules DDC-PLUS LON-RAIL/LON-SAFE [details on page 6.7]
- **Building-Management-System ViSi-PLUS** [details on page 7.3]
The programming tool for DDC-PLUS systems

Advantages of the PG5 programming tools

■ Program portability: PG5 programs can run on all SAIA® PCD platforms.
■ Program organization by files (containing several program blocks) simplifies the shared use of program files between several SAIA®PCD controllers.
■ Accepts existing PG3 and PG4 programs.
■ Programming and debugging environments united in each program editor.
■ Simple programming of terminal displays with the HMI Editor.
■ Powerful instruction set supported by macros and assembler directives.

Features of the PG5

■ Symbol Manager administers all local, global and network symbols or symbol groups. Automatic address allocation largely dispenses with the need for fixed addressing.
■ Project Manager administers complex installations of networked PCDs, including displays and documentation.
■ Online functions for commissioning and error detection via Ethernet-TCP/IP, SAIA®S-Bus, modem, etc.
■ Integrated programming environments:
  – FUPLA (function block diagram)
  – S-Edit (instruction list IL)
  – GRAFTEC (sequential function chart)
■ Integrated network editors for SAIA®S-Bus, PROFIBUS DP and FMS, LonWorks®.
■ Extensive additional libraries for HeaVAC, modem and EIB broaden the scope of PG5 functions.

Overview in the project tree ...

It is similar to the Windows Explorer and functions very much like it. The window “Project” gives direct access to all DDC systems used in the project with their adjustments and the respective program data groups and documents.

The program organisation according to data groups (with various program blocks) makes the concurrent use of program data groups in various stations easier. The commonly used program parts are in the file “Common Files”. Thus changes in one station at once become effective for all participating stations.

... and Project Manager

The project tree and the windows of the project manager guarantee at any time the complete overview even on complicated projects with networked DDC systems.

Message window

In this window mistake or status information as well as the protocol of assembling are indicated. Mistakes in the program code are listed here after assembling and can be localised directly by mouse click.

Furthermore the user finds in the PG5 package modules such as on-line debuggers, cross reference data window, etc. which make working and overview easier.
A choice of program editors

FUPLA

FUPLA is Saia’s own function block diagram editor. It differs in many respects to other graphical editors:

- One FUPLA file can contain several program blocks. This means that one file can encompass an entire building function. Each program block has its own symbol name, to avoid duplication.
- FUPLA blocks are organized into pages. Each page can produce several outputs. Unlike conventional editors, this allows more functionality to be visible at a glance on a single page.
- The graphical function boxes (FBoxes) have inputs and outputs, and can also have configurable properties using parameter windows which can also be modified online.

GRAFTEC

GRAFTEC (sequential function chart) is particularly suitable for sequential processes. The PCD executes GRAFTEC structure instructions directly, and optimises processing time.

S-Edit (instruction list)

The editor for the SAIA®PCD’s powerful instruction set. S-Edit combines an editor with an online debugger in a single application.

Symbol Editor

The symbol editor is the heart of the PG5. It defines and documents all symbols used by the program.

- Shortcuts and intelligent indexed addressing simplify the entry of symbols.
- The program editors share the same symbol editor. New symbols entered in the program code are added to or read from the symbol editor.
- The Import/Export function allows the reuse of predefined I/O lists in electrical diagrams and process visualization tools.
- Auto-allocation largely dispenses with the need for fixed addressing.
- Symbol names be up to 80 characters long.
- Symbols can be grouped by their function. This makes it easier to use and recognise symbols in the program, and also gives a clearer overview in the symbol editor.

Network configuration

Networks such as SAIA®S-Bus, PROFIBUS DP and FMS or LonWorks® can be constructed on the screen with menu prompting.
Standard FBoxes

Technical data / Ordering details

**Standard FBoxes**

Around 250 FBoxes are already provided in the basic PG5 package. The range of functions goes far beyond the normal binary and arithmetic functions. For details see Technical Information 26/367. Standard FBoxes are classified in families, as in the following summary:

**Data Communications**

This family of FBoxes allows resources to be read and written via a SAIA®S-Bus network. Communication does not always have to be cyclical, but can if necessary be program-controlled. Other functions can be used, for example, to synchronize all real-time clocks in a network.

**Text Communications**

Enables the simple reception and transmission of text via one of the serial ports.

**Data Blocks**

These simplify the saving of data in data blocks. A data logger FBox is also provided.

**Regulation**

Every PCD has built-in PID control. The PID FBox has parameters which can be modified online.

**Special**

These allow the PCD’s special functions to be used in FUPLA programs. For example:

- Read battery status
- Process hardware interrupt
- Read and write Flash EPROM registers

**Time related**

The conventional time function elements, plus:

- FBoxes for cycle time measurement
- Read and write the real-time clock
- A chronometer

**Buffers**

FIFO and LIFO buffers for binary, floating-point and integer data.

**System information**

Allows system information to be used in the FUPLA program so that, for example:

- The system counter can be read.
- The SAIA®S-Bus station number can be read and modified.
- The PCD type and firmware version can be read in the program. This makes it possible, for example, to monitor whether a program is actually running in the planned environment.

**Technical data**

<table>
<thead>
<tr>
<th>Operating system</th>
<th>from Windows 95 B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>from Windows 98 second edition</td>
</tr>
<tr>
<td></td>
<td>from Windows NT 4.0 SP5</td>
</tr>
<tr>
<td></td>
<td>from Windows 2000</td>
</tr>
<tr>
<td>TCP/IP</td>
<td>must be installed</td>
</tr>
<tr>
<td>TAPI</td>
<td>2.0 must be installed</td>
</tr>
<tr>
<td>IBM-compatible PC</td>
<td>Pentium 150 or better;</td>
</tr>
<tr>
<td></td>
<td>52 MB RAM or more;</td>
</tr>
<tr>
<td></td>
<td>50 MB free hard disk;</td>
</tr>
<tr>
<td></td>
<td>CD-ROM drive</td>
</tr>
<tr>
<td>PCD instruction set</td>
<td>all 150 PCD instructions are</td>
</tr>
<tr>
<td></td>
<td>supported</td>
</tr>
<tr>
<td>Standard FBoxes</td>
<td>the PG5 has over 250 standard</td>
</tr>
<tr>
<td></td>
<td>FBoxes</td>
</tr>
<tr>
<td>Modem</td>
<td>basic modem configuration and</td>
</tr>
<tr>
<td></td>
<td>communication are implemented</td>
</tr>
<tr>
<td></td>
<td>in the PG5</td>
</tr>
<tr>
<td>Programming languages</td>
<td>Instruction List (IL), FUPLA (FBD)</td>
</tr>
<tr>
<td></td>
<td>and GRAFTEC (SFC)</td>
</tr>
<tr>
<td>CPUs supported</td>
<td>all SAIA®CPU models are supported</td>
</tr>
<tr>
<td>Compatibility</td>
<td>PG3 and PG4 programs can still be</td>
</tr>
<tr>
<td></td>
<td>used with PG5</td>
</tr>
<tr>
<td>Communication</td>
<td>TCP/IP, SAIA®-Bus, PROFIBUS DP,</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS FMS and LonWorks®</td>
</tr>
<tr>
<td></td>
<td>communication are present in PG5</td>
</tr>
</tbody>
</table>

**Ordering details**

**PCD8.P59 000D9** Complete PG5 package
The package contains a licence diskette, documentation and the program on CD-ROM

**PCD8.P59 000M1** PG5 demo package
The package contains the full version of PG5, but the printing of program files has been disabled and processing restricted to programs no greater than 2000 lines in size.

**PCD8.K111** Connection cable
between PGU connector and PC COM port with 9-pole connector
The HeaVAC library –
comfortable solutions for the heating, ventilation,
air-conditioning and building technology

Clear advantages for the application of
the HeaVAC library

■ Very much simplified programming by the use of HeaVAC FBoxes with functions occurring again and again in all buildings: heating circuits, pumps, ventilators, sequences in mono blocks for light control, etc.

■ Detailed help information by clear description and graphical representation of each function.

■ The build-up of complicated installations is made by simple placing of graphic components (FBoxes); for doing this you do not need profound programming knowledge.

■ Cost saving when putting into operation and maintaining: the graphical representation of the FBoxes in the FUPLA Editor simplifies understanding and reading of the program.

■ The on-line-view of the HeaVAC FBoxes in the FUPLA Editor helps very much with putting into operation of an installation. The process sizes are indicated and parameters can be changed on-line.

The essential features of the HeaVAC library

■ More than 150 function components (FBoxes) can be used in the HeaVAC library.

■ Clear classification in 12 families; by the tree structure similar to the Windows Explorer, the functions needed are found easily.

■ Changes of the parameters through adjusting windows: most FBoxes have a lot of parameters which can be changed comfortably through these adjusting windows without losing the overview of the program.

■ Clear distinction of the data types by identification with different colours.

■ Import of object lists into the HMI Editor of the SAIA® text terminals also taking over the connection to the corresponding FBox as well as all the texts, data sources, formats, etc. Thus internal process parameters can be read and changed on a user terminal.
The FBoxes of the HeaVAC library

Parameter window with on-line view
In order not to overload the representation with unnecessary lines the FBoxes marked with a triangle have got a so-called adjusting window (Adjust).

In the adjusting window, information for the user are represented on-line and parameters such as time-switch-functions or control adjustments can be adapted directly by the user.

Clear classification into families
All the FBoxes (function boxes) have been classified into families. A selected FBox can be placed in the program by “drag and drop”. The HeaVAC library can be found in the register “Application”.

Easy differentiation between data types
Each data type is identified with a different colour. This makes programs easier to read.

- Binary data: red
- Integer data: green
- Floating-point data: yellow

Text data is inserted in text fields.

Transition-triggered inputs are marked with a wedge.

¹) These data are used with a 1/10 resolution.

The user will find detailed help information for each FBox directly in the on-line mode (example heating curve).
Practical examples

**Supervision of a motor control**

The function controls the starting of a motor, indicates defects in the power sector or e. g. overheating of the motor. A general control of the process with feedback can be used for verification.

---

**Control sequences**

For each category various FBoxes can be used. Because of this modular concept the user can realize many different control sequences adapting the solution to the requirements of the application. If necessary, all the other functions of the HeaVAC library as well as those of the standard library can be used in this structure.

---

**Ordering details**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD9.B59 HVC M5</td>
<td>HeaVAC library</td>
</tr>
<tr>
<td>26/745 E</td>
<td>Manual to the HeaVAC library</td>
</tr>
<tr>
<td>26/749 E</td>
<td>FUPLA/KOPLA manual</td>
</tr>
</tbody>
</table>
SAIA®VARIO-PLUS –
The comprehensive controller system for combined heat and power plants (CHP)

What is SAIA®VARIO-PLUS?

- SAIA®VARIO-PLUS is the name of an all-inclusive control system for combined heat and power plants (CHP).
- The VARIO filter system and VARIO function module are integral, complementary components of the SAIA®DDC-PLUS automation systems, PCD1 and PCD2.
- All the relevant functions for CHP can be processed selectively and are combined in a single controller.
- All external components for mains monitoring, synchronization, generator monitoring and regulation can therefore be dispensed with.
- The overall system allows the acquisition of quickly changing process values and is capable of calculating and outputting correcting variables in the shortest possible time.
- SAIA®VARIO-PLUS works equally with the standard PCD1 and PCD2 automation systems and with STEP®7 programmable controllers from the xx7 Series (STEP®7 from Siemens®).

SAIA®VARIO-PLUS offers these functions:

- Measurement and monitoring
  - Frequency, voltage and current of grid and generator, up to 3 phases
  - Vector bounce, 1 or 3-phase
  - \( \cos \phi \)
  - Lambda voltage
  - Battery voltage
- Regulation and control
  - Synchronization and reverse synchronization
  - Speed and power regulation for up to two parallel primary energies
  - Regulation of lambda (lambda 1 and lean operation)
- Calculation
  - Reverse power monitoring from current, voltage and \( \cos \phi \)
General system information

SAIA®DDC-PLUS automation systems meet the stringent requirements of integral building automation. The systems are distinguished by their modularity, varied communications and networking capabilities, and consistent software compatibility throughout the whole system family.

The SAIA®VARIO-PLUS energy management system comprises specific hardware and software components for PCD1 and PCD2 automation systems that control combined heat and power plants (CHP) while also distributing and exploiting the thermal and electrical energy generated. To meet demands that range from stand-by power equipment to large CHPs, 5 variations of the VARIO system are available:

**SAIA®VARIO-PLUS Standard**
Comprises all components for the usual requirements of a CHP. The system can be built up to form the “Extended” version.

**SAIA®VARIO-PLUS Extended**
Comprises extended components for maximum CHP requirements.

**SAIA®VARIO-PLUS Reduced**
Comprises components for the requirements of stand-by power equipment. The system is cannot be extended.

**Overview of VARIO system variants**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIO function module PCD7.L900</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>VARIO filter module PCD7.L920/..L927</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>VARIO filter module, reduced PCD7.L910/..L917</td>
<td>–</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>VARIO filter extension PCD7.L921</td>
<td>–</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>VARIO voltage module 3-phase PCD7.L930/..L935</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>VARIO voltage module 1-phase PCD7.L951</td>
<td>1</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>VARIO current module 3-phase PCD7.L940</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>VARIO system cable analogue PCD7.L905</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>VARIO system cable digital PCD7.L906</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Only complete systems are supplied by the factory: SAIA®VARIO-PLUS Standard, Extended or Reduced. The individual modules of SAIA®VARIO-PLUS are only available for replacement purposes and for extensions.

SAIA®VARIO-PLUS software
Software integration is carried out with detailed software function boxes for the SAIA® PG5 programming tool and with FBs/FCs for the STEP®7 programming tool by Siemens®.

You will get further information from the Technical Information 26/347.

STEP® and Siemens® are registered trademarks of Siemens AG.
The VARIO function module plugs into an I/O module socket on the PCD2 automation system. The function module has its own microprocessor for evaluating acquired process data and outputting calculated process data. Connection to the filter module is via 2 system cables.

The module essentially executes the following functions, without burdening the main processor of the PCD system:

**Monitoring**
- Surge voltage/under-voltage
- Overload current/undercurrent
- Overfrequency/underfrequency
- Vector bounce

**Acquisition**
- Speed via pick-up

**Calculation**
- \(\cos\phi\), four-quadrant evaluation

**Control**
- Synchronization/reverse synchronization

**Regulation**
- Speed
- Frequency
- Output

**VARIO filter module PCD7.L920/..L927**

The VARIO filter module uses plug in modules to register voltages and currents from the grid and generator, processing 7 values or, with the additional filter extension module, a total of 12 values.

In addition, the module includes the grid and generator relays, the synchronization relay and all necessary process interfaces (lambda 1+2, battery voltage 1+2, speed, etc.).
## Ordering details

### Voltage, current and relay output modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L930</td>
<td>Voltage module, 230 VAC 3-phase, rotary current, with electrical isolation</td>
</tr>
<tr>
<td>PCD7.L935</td>
<td>Voltage module, 100 VAC 3-phase, rotary current, with electrical isolation</td>
</tr>
<tr>
<td>PCD7.L931</td>
<td>Voltage module, 230 VAC 1-phase, alternating current, with electrical isolation</td>
</tr>
<tr>
<td>PCD7.L940</td>
<td>Current module, 1 A, AC To measure output, it is necessary to superpose a converter to max. 1 A on the module. This converter also provides electrical isolation from the mains.</td>
</tr>
<tr>
<td>PCD2.A220 Z36</td>
<td>Relay output modules This module is required for operating modes “continuous switch operation” or “pulsed switch operation” and plugs into one of the I/O module sockets of the PCD1 or PCD2 automation system.</td>
</tr>
</tbody>
</table>

### Ordering details

Every system variant includes all necessary modules, with the exception of the relay output module. Regarding the PCD1 and PCD2 automation systems, please consult the appropriate technical information documents.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L900</td>
<td>Function module</td>
</tr>
<tr>
<td>PCD7.L920/..L927</td>
<td>Filter module</td>
</tr>
<tr>
<td>PCD7.L910/..L917</td>
<td>Filter module Reduced</td>
</tr>
<tr>
<td>PCD7.L921</td>
<td>Filter extension module</td>
</tr>
<tr>
<td>PCD7.L930</td>
<td>Voltage module, 230/10 V 3-phase</td>
</tr>
<tr>
<td>PCD7.L935</td>
<td>Voltage module, 100/10 V 3-phase</td>
</tr>
<tr>
<td>PCD7.L931</td>
<td>Voltage module, 230/10 V 1-phase</td>
</tr>
<tr>
<td>PCD7.L940</td>
<td>Current module, 1 A</td>
</tr>
<tr>
<td>PCD7.L905</td>
<td>Connecting cable, analogue</td>
</tr>
<tr>
<td>PCD7.L906</td>
<td>Connecting cable, digital</td>
</tr>
</tbody>
</table>

The following type designations only apply to replacements or extensions:

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD9.B79090D4</td>
<td>VARIO-FBs and FCs for Siemens® STEP®7</td>
</tr>
</tbody>
</table>
Plug-in system cables with connector at PCD end

The route to quick, convenient connection includes pre-assembled cable. At the PCD end of the cable the connector is ready mounted, so connection is just a matter of plugging it in. At the process end there are ribbon connectors for the terminal adapters or relay interface, or numbered strands, or colour-coded strands.

You will get further information from the Technical Information 26/326.

**Cable PCD2.K22..**
for the digital I/O modules ..E160, ..E161 and ..A460

Sheathed, round cable with 52 strands of 0.25 mm² (AWG 24) 54-pole ribbon connector at PCD end, free ends on process side, 100 mm, unsheathed, strands with colour code

**Cable PCD2.K28..**
for ..A250 relay output module

Sheathed, round cable with 14 strands of 0.5 mm² 14-pole, plug-in screw terminal block at PCD end, free ends on process side, unsheathed for 100 mm, with numbered strands

**Cable PCD2.K27..**
for analogue I/O and ..H.. modules

Sheathed, shielded, round cable with 10 strands of 0.25 mm², shielding drawn out at both ends 10-pole, plug-in screw terminal block at PCD end, free ends on process side, unsheathed for 100 mm, with colour coded strands

Spring terminals as an option for PCD2.M170/..M177

A spring terminal block (item number: 4’405’4914’0), which can be attached in place of the screw terminal block, is available for all 10-pole I/O modules. The terminals take connecting wires of 1.5 mm² solid or 1 mm² fine-strand. On request, the relevant modules can also be supplied ready assembled (Indicate on order: “with spring terminal block”).
Ribbon/screw terminal adapters and relay interface

Ribbon/screw terminal adapters for digital I/O modules ..E160, ..E161, ..A460

- **Ribbon/screw terminal adapters PCD2.K52.. for 16 inputs or 16 outputs**
  - 34-pole ribbon connector at PCD end, 20 screw terminals at process end, 0.5...1.5 mm²
- **Cable PCD2.K23..**
  - Sheathed, half-round cable with 34 strands of 0.09 mm², 34-pole ribbon connector at both ends

- **Ribbon/screw terminal adapters PCD2.K51.. for 8 inputs or 8 outputs**
  - 16-pole ribbon connector at PCD end, 12 screw terminals at process end, 0.5...1.5 mm²
- **Cable PCD2.K24..**
  - Sheathed, half-round cable with 34 strands of 0.09 mm², 34-pole ribbon connector at PCD end, divided on process side into 2 branches, each 500 mm in length, leading to 16-pole ribbon connectors

**Ordering details**

- **Cable for digital I/O modules with 16 I/Os**
  - PCD2.K221 length 1.5 m
  - PCD2.K223 length 5.0 m
- **Cable for digital I/O modules with 10-pole**
  - PCD2.K261 length 1.5 m
  - PCD2.K263 length 5.0 m
- **Cable for ..A250 relay output module**
  - PCD2.K281 length 1.5 m
  - PCD2.K283 length 5.0 m
- **Cable for analogue I/O and ..H.. modules**
  - PCD2.K271 length 1.5 m
  - PCD2.K273 length 5.0 m
- **Ribbon/screw terminal adapters**
  - PCD2.K510 for 8 I/Os, without LEDs
  - PCD2.K511 for 8 I/Os, with LEDs
  - PCD2.K520 for 16 I/Os, without LEDs
  - PCD2.K521 for 16 I/Os, with LEDs
- **Relay interface**
  - for 8 outputs, with LEDs
  - PCD2.K551
- **Half-round cable to adapters or relay interface**
  - PCD2.K231 length 1.0 m
  - PCD2.K232 length 2.0 m
  - PCD2.K241 length 1.0 m
  - PCD2.K242 length 2.0 m

¹ Other cable lengths on request
**DC/DC isolating amplifier**

**Galvanical separation of analogue signal circuits or for voltage/current conversion**

As the name “isolating amplifier” states, the KFD1 isolates individual analogue channels not only from input to output, but also from the supply and from frame ground potential. This galvanical separation is particularly recommended for long lines in large installations.

However, the KFD1 can also be used to amplify a weak signal and convert it into a noise-proof current signal.

### Technical data

**Input ranges**¹)
- KFD11: 0...10 VDC, input impedance 200 kΩ or 0...20 mA, load 47 Ω ²)
- KFD12: 0...75 VDC, input current 0...3 mA or 0...60 mV, input current 0...60 µA ³)

**Output ranges**¹)
- 0...10 VDC (≥3 kΩ); load 0...20 mA, (≤500 Ω)

**Input/output**
electrically isolated with optical isolating amplifier

**Conversion time** 20 ms

**Short-circuit proof**
yes, 1 minute, fault current <100 mA

**Status display**
LED green: supply voltage present

**Isolating characteristics**
800 VDC between supply, input and output

**Accuracy**
0.5 % of final value

**Supply voltage**
19...70 VDC or 24 V ±20 % full-wave rectified

**Power consumption**
1.0...2.4 W depending on voltage and load

**Duty cycle** 100%

**Terminals**
screw terminals for 1 × 0.5 mm² t 2 × 2.5 mm²

**Mounting**
surface mounting; snap-on mounting onto 55 mm DIN-rail or screw fixing by adapter (accessory) and 2 screws M4

**Ambient temperature**
operation 0...50 °C, storage –25...+70 °C

**Atmospheric humidity**
95 % r. h. without condensation (DIN 40 040, class F)

**EMC/Interference**
EN 61 000-4-4 (2 kV) at input and immunity output
EN 61 000-4-4 (4 kV) at supply

**EMC/Emissions**
EN 55 022, class B

¹) 2 input ranges / 2 output ranges selectable with 2 slide switches on front panel
²) Overvoltage protection by stress limiter, 27 V max.
³) Overcurrent or overvoltage protection by stress limiter

### Ordering details

**Isolating signal amplifier DC/DC**
- **KFD11.JVTN** with input and output ranges 0...10 VDC or 0...20 mA
- **KFD12.JVTN** with input ranges 0...75 VDC or 0...60 mA and output ranges 0...10 VDC or 0...20 mA
RS 485 bus components for SAIA®S-Bus and PROFIBUS FMS or DP

Network communication saves costly wiring and offers a high level of comfort. The foundations of a perfectly functioning network in an industrial environment are laid with a carefully and professionally installed physical bus line.

Bus components for SAIA®S-Bus and PROFIBUS networks assist in this. They produce faultless idle signals, terminate bus lines perfectly and, with electrical isolation, eliminate the noise effects of potential differences.

**General technical data**

**Supply**
24 VDC +20%/-15%, smoothed or 19 VAC ±15% from transformer, full-wave rectified

**Current consumption**
max. 100 mA

**Connection**
with front-panel screw terminals for connecting wires max. 2 × 1.5 mm² (incl. end sleeve)

**Mounting**
snap onto 35 mm DIN rail or fasten with 2 × M4 screws

**Termination box PCD7.T160**
This is used for electrical isolation between the supply and the RS 485 network, including idle signal bias voltage and the optimum termination of bus lines. Use in range up to 12 Mbit/s.

**Converter PCD7.T120 (RS 232) and PCD7.T140 (RS 422)**
Enables the isolated connection of a station with an RS 232 or RS 422 interface to the S-Bus network (RS 485). Operating range with PC operating system NT up to 58.4 kBit/s, with Windows 95/98 up to 9.6 kbit/s.

**Repeater PCD7.T100**
This allows the RS 485 bus to be extended and simultaneously divided into 2 bus segments with mutual electrical isolation. Bus frequency is adjustable between 110 bit/s and 500 bit/s. Repeaters also allow tree structures to be produced, with up to 5 repeaters being switchable in series.

**Ordering details**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.T160</td>
<td>Termination box</td>
</tr>
<tr>
<td>PCD7.T120</td>
<td>Converter RS 232 ↔ RS 485</td>
</tr>
<tr>
<td>PCD7.T140</td>
<td>Converter RS 422 ↔ RS 485</td>
</tr>
<tr>
<td>PCD7.T100</td>
<td>Repeater</td>
</tr>
<tr>
<td>26/740 E</td>
<td>Manual</td>
</tr>
</tbody>
</table>
### Coupler modules DDC-PLUS COUPLE

#### PCD7.L250: Reversing switch with manual control level Auto/0/Manual
- 1 reversing switch
- Manual control level
- Manual acknowledge
- LED display
- 11.2 mm overall width

Single-stage coupler module with manual control level, acknowledgement of switch position and an LED for status display.

#### PCD7.L260: Coupler module for two-stage motor control
- Mutually latched relay
- Manual control level
- Manual acknowledge
- LED display
- 22.5 mm overall width

When switching back from stage 2 to stage 1, stage 2 is switched off first and, after a <60 ms delay, stage 1 is switched on. A manual control level has been integrated for service purposes. The time function is operational here too.

#### PCD7.L450: Analogue value transmitter for manual correcting variables
- Potentiometer 0…10V
- Manual control level
- Manual acknowledge
- LED display
- 22.5 mm overall width

The analogue value transmitter has two operating modes: AUTO and MANU. In the AUTO switch position, the correcting variable is looped without modification via the YR terminal to correcting variable output Y. In the MANU switch position, it is possible to define the correcting variable with the potentiometer on the front panel. The output signal is available at terminal Y.

---

e.g. as manual control for heating or cooling water pumps

e.g. as manual control for 2-step ventilators

e.g. as manual control for valves and adjusting components 0…10 V
Technical data and ordering information

### Reversing switch PCD7.L250

- **Supply voltage:** 24 VDC/VAC, ±10%
- **Operation display:** LED red to display relay status
- **Switch (manual acknowledge):**
  - Breaking capacity max. 48 V/50 mA AC/DC, min. 20 mV/1 µA AC
- **Output contact:**
  - 1 reversing switch
  - Turn-on voltage max. 250 VDC/VAC, current at make max. 8 A, constant current 6 A
  - Breaking capacity (ohmic load) 24 VDC/150 W, 50 VDC/25 W, 250 VDC/50 W, 250 VAC/1500 VA
  - Breaking capacity min. 24 VDC/20 mA
- **Ambient temperature:**
- **Dimensions:** 11.2 × 60 × 60 mm (W × H × D)

### Coupler module PCD7.L260

- **Supply voltage:** 24 VDC, ±10%
- **Operation display:** two red LEDs to display relay status
- **Switch (manual acknowledge):**
  - Breaking capacity 24 VDC, max. 2.5 mA
- **Output contact:**
  - 1 reversing switch with 0 position
  - Turn-on voltage max. 250 VDC/VAC, current at make max. 6 A, constant current 4 A
  - Breaking capacity (ohmic load) 24 VDC/150 W, 50 VDC/25 W, 250 VDC/50 W, 250 VAC/1500 VA
  - Breaking capacity min. 24 VDC/20 mA
- **Ambient temperature:**
- **Dimensions:** 22.5 × 60 × 60 mm (W × H × D)

### Analogue value transmitter PCD7.L450

- **Supply voltage:** 24 VDC/VAC, –15%/+20%
- **Input/output voltage:** 0...10 VDC
- **Operation display:**
  - LED red (brightness proportional to correcting variable)
- **Switch (manual acknowledge):**
  - Breaking capacity max. 28 V/2 A AC/DC (ohmic load)
- **Ambient temperature:**
  - Operation: –10 °C...+50 °C, storage: –25 °C...+70 °C
- **Dimensions:** 22.5 × 60 × 60 mm (W × H × D)

You will get further information from the Technical Information 26/358.

### Ordering information

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD7.L250</td>
<td>Reversing switch with manual control level</td>
</tr>
<tr>
<td>PCD7.L260</td>
<td>Coupler module for two-stage motor control</td>
</tr>
<tr>
<td>PCD7.L450</td>
<td>Analogue value transmitter for manual correcting variables</td>
</tr>
</tbody>
</table>
Efficiency, independence and mutual trust – the conditions for a successful partnership

The Saia-Burgess Controls group of companies concentrates its building automation activities exclusively on developing and producing hardware and software. Therefore, in its own interests and those of the final customer, it supports selected providers of services.

Independent SAIA®DDC-PLUS system partners guarantee, through their know-how, proximity to customers and flexibility, the best possible advice, planning and implementation of technical systems for buildings.

Partners have the necessary hardware and software knowledge, extending from the sensor to the building management system. This flexible network of partners guarantees that all projects, from the small to the large and ambitious, are carried out expertly.

If you want a partner near your firm contact your representation of Saia-Burgess Controls.